



This is a digital copy of a book that was preserved for generations on library shelves before it was carefully scanned by Google as part of a project to make the world's books discoverable online.

It has survived long enough for the copyright to expire and the book to enter the public domain. A public domain book is one that was never subject to copyright or whose legal copyright term has expired. Whether a book is in the public domain may vary country to country. Public domain books are our gateways to the past, representing a wealth of history, culture and knowledge that's often difficult to discover.

Marks, notations and other marginalia present in the original volume will appear in this file - a reminder of this book's long journey from the publisher to a library and finally to you.

Usage guidelines

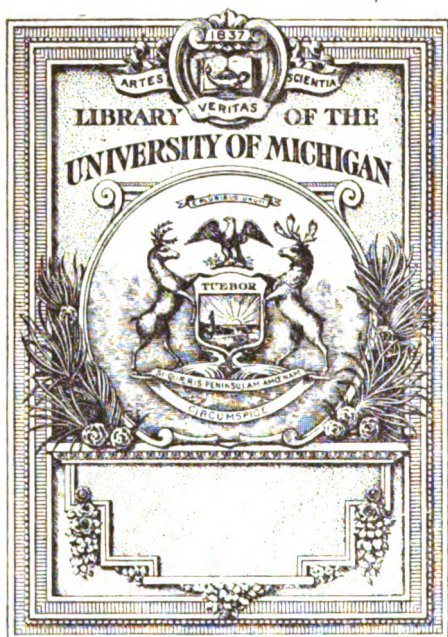
Google is proud to partner with libraries to digitize public domain materials and make them widely accessible. Public domain books belong to the public and we are merely their custodians. Nevertheless, this work is expensive, so in order to keep providing this resource, we have taken steps to prevent abuse by commercial parties, including placing technical restrictions on automated querying.

We also ask that you:

- + *Make non-commercial use of the files* We designed Google Book Search for use by individuals, and we request that you use these files for personal, non-commercial purposes.
- + *Refrain from automated querying* Do not send automated queries of any sort to Google's system: If you are conducting research on machine translation, optical character recognition or other areas where access to a large amount of text is helpful, please contact us. We encourage the use of public domain materials for these purposes and may be able to help.
- + *Maintain attribution* The Google "watermark" you see on each file is essential for informing people about this project and helping them find additional materials through Google Book Search. Please do not remove it.
- + *Keep it legal* Whatever your use, remember that you are responsible for ensuring that what you are doing is legal. Do not assume that just because we believe a book is in the public domain for users in the United States, that the work is also in the public domain for users in other countries. Whether a book is still in copyright varies from country to country, and we can't offer guidance on whether any specific use of any specific book is allowed. Please do not assume that a book's appearance in Google Book Search means it can be used in any manner anywhere in the world. Copyright infringement liability can be quite severe.

About Google Book Search

Google's mission is to organize the world's information and to make it universally accessible and useful. Google Book Search helps readers discover the world's books while helping authors and publishers reach new audiences. You can search through the full text of this book on the web at <http://books.google.com/>



61015
E23
M5
S9

Digitized by Google

THE
EDINBURGH
MEDICAL AND SURGICAL
JOURNAL:
EXHIBITING
A CONCISE VIEW
OF THE
LATEST AND MOST IMPORTANT DISCOVERIES
IN
MEDICINE, SURGERY, AND
PHARMACY.

VOLUME THIRTY-FOURTH.
1830.
UNIV. & BELL. HOSP. MEDICAL COLLEGE.
READING ROOM.

EDINBURGH:
PRINTED FOR ADAM BLACK, NORTH BRIDGE:
LONGMAN, REES, ORME, BROWN AND GREEN, LONDON: AND
JOHN CUMMING, AND HODGES AND SMITH, DUBLIN.

1830.

21

PRINTED BY JOHN STARK, EDINBURGH.

THE
EDINBURGH
MEDICAL AND SURGICAL JOURNAL,
No. CIV.
CONTENTS.

PART I.—ORIGINAL COMMUNICATIONS.

| | PAGE |
|--|------|
| ART. I. Quarterly Report of the Edinburgh Surgical Hospital from March to June 1830. By JAMES SYME, Esq. | 1 |
| II. On the Diagnosis of the Diseases of the Lungs and Pleura. By J. C. GREGORY, M. D., F. R. S. E. | 24 |
| III. On the Efficacy of Mercurial Purgatives in Purpura, whether Simple or Hemorrhagic; and on the circumstances which justify Blood-letting in these Diseases. By WILLIAM HARTY, M. D. | 57 |
| IV. An Answer to some Objections proposed by Xavier Bichat against the opinions of Goodwyn, respecting the cause of the cessation of the action of the Heart in Asphyxia from Suffocation. By the late EDMUND GOODWYN, M. D. | 74 |
| V. Cases of Hare-Lip, with protrusion of the central part of the Alveolar Process of the Upper Jaw. By ANDREW DEWAR, Surgeon. | 88 |
| VI. Reports on the Diseases and Weather of Dublin. By D. J. CORRIGAN, M. D. | 91 |
| VII. Observations on Acupuncture. By JOHN RENTON, M. D. | 100 |
| VIII. An Account of two cases of Malformation.—I. Of the Heart, with Morbus Cæruleus.—II. Of the Head, Cervical Spine, Diaphragm, &c. By WILLIAM CAMPBELL, M. D. | 107 |
| IX. Case of Phlegmonous Erysipelas successfully treated by the Nitrate of Silver. By JOHN HODGSON, Esq. | 111 |
| X. On a peculiar motion excited in Fluids by the surfaces of certain Animals. By WILLIAM SHARPEY, M. D. | 113 |

PART II.—CRITICAL ANALYSIS.

| | |
|--|-----|
| ART. I. Illustrations of some of the principal Diseases of the Ovaria, their Symptoms and Treatment; to which are prefixed Observations on the Structure and Functions of those parts in the Human Being and in Animals. By EDWARD J. SEYMOUR, M. D. | 123 |
| II. Sketches of the Medical Topography of the Mediterranean, comprising an account of Gibraltar, the Ionian Islands, and Malta; to which is prefixed a sketch of a plan for memoirs on Medical Topography. By JOHN HENNEN, M. D., F. R. S. E. Inspector of Military Hospitals, &c. Edited by his son, J. HENNEN, M. D. &c. | 140 |
| III. On the Anatomical Characters of some Adventitious Structures. By DR HODGKIN, | 164 |
| IV. Observations on the Functional Disorders of the Kidneys, which give rise to the Formation of Urinary Calculi: with Remarks on their frequency in the county of Norfolk. By WILLIAM ENGLAND, M. D. &c. | 175 |
| V. Pathological Researches on Inflammation of the Veins of the Uterus, with additional observations on Phlegmasia Dolens. By ROBERT LEE, M. D. | 178 |

| | |
|--|-----|
| VI. Practical Remarks on Amputations, Fractures, and Strictures of the Urethra. By STEPHEN LOVE HAMMICK, Surgeon, | 185 |
| VII. The influence of Climate in the Prevention and Cure of Chronic Diseases, more particularly of the Chest and Digestive Organs: Comprising an account of the principal places resorted to by Invalids in England, the South of Europe, &c. ; a comparative estimate of their respective merits in particular diseases; and general directions for Invalids while travelling and residing abroad. With an Appendix, containing a series of Tables on Climates. By JAMES CLARK, M. D. | 192 |
| VIII. 1. A Treatise on Hysteria. By GEORGE TATE, | |
| 2. Observations on the Disorders of Females, connected with Uterine Irritation. By THOMAS ADDISON, M. D. | 194 |

PART III.—MEDICAL INTELLIGENCE.

| | |
|--|-----|
| Case of Apoplexy of the Spinal Cord, | 203 |
| On the Chemical Solution or Digestion of the Coats of the Stomach after death, | 203 |
| On the Effects and Treatment of the bite of the Venomous Snakes of Paraguay, | 205 |
| Experiments on the Transfusion of Blood, | 208 |
| M. Roux on Excision of Diseased Joints, | 209 |
| Extirpation of a large Tumour from behind the lower Jaw, | 210 |
| On Murder by Poisoning with the Mineral Acids, | 212 |
| Poisoning with Empyreumatic Oil, | 214 |
| Poisoning with Cantharides-powder, | 214 |
| On the Poisonous effects of certain spoiled articles of Food, | 215 |
| Poisoning with Bismuth, | 216 |
| Extracts from the Parisian Bills of Mortality for 1828, | 217 |
| On the difference in Mean Longevity between the Rich and Poor, | 218 |
| Hunterian Medal, | 219 |
| Harveian Society of Edinburgh, | 219 |

NOTICES TO CORRESPONDENTS.

Communications have been received from Dr STOKES, and Mr HART, Mr S. G. LAWRENCE, Mr BODKIN, and Mr RANKEN of Ayr.

The following Works have come to hand :—

Mémoires sur les Hémorrhagies Internes de l'Utérus, qui a obtenu le prix d'émulation au concours ouvert, (en 1818,) par la Société de Médecine de Paris. Par Mad. Veuve Boivin, Ancienne élève, et surveillante en chef à l'hospice de la Maternité ; Maitresse sage-femme surveillante en chef de la Maison royale de Santé, &c. &c. Suivi des Aphorismes d'Andrew Blake, sur les Hémorrhagies Uterines. A Paris, 1819. 8vo. Pp. 191.

Recherches sur une des Causes les plus fréquentes et la moins connue de l'avortement ; suivies d'un mémoire sur l'intro-pelvimetre, ou mensurateur interne du bassin ; couronné par la Société Royale de Médecine de Bordeaux. Par Mad. Veuve Boivin, Docteur en Médecine de l'Université de Marbourg ; Membre correspondant de la Société Royale de Médecine de Bordeaux, &c. &c. &c. Paris 1829. 8vo. Pp. 212.

Nouvelles Recherches sur l'origine, la nature, et le traitement de la mole vesiculaire ou Grossesse Hydatique. Par Mad. Veuve Boivin, Maitresse sage-femme, &c. &c. &c. Avec figure 1827. 8vo. Pp. 80.

Considérations sur l'état de la Police Médicale dans le Royaume des Pays-Bas. Par Pierguin, D. M. Pp. 8. 8vo.

Sketches of the Intellectual and Moral Relations. By Daniel Pring, M. D. Member of the Royal College of Surgeons. London, 1829. 8vo. Pp. 466.

Observations on the Pathology of Venereal Affections. By Benjamin Travers, F. R. S. and Senior Surgeon to St Thomas's Hospital. London, 1830. 8vo. Pp. 75.

Surgical Observations on the most important diseases of the Mucous Canals of the Body ; being a second edition of the Author's Treatise on Stricture of the Urethra. To which are added Practical Observations on Contraction of the Oesophagus and Rectum ; an Essay on the Diagnosis of Hernial and other Tumours in the Groin : with remarks on Tracheotomy, as connected with the treatment of Chronic Laryngitis. By George Macilwain, M. of the R. Coll. of Surgeons, &c. &c. London, 1830. 8vo. Pp. 337.

A Treatise on Deformities ; exhibiting a Concise View of the Nature and Treatment of the principal distortions and contractions of the Limbs, Joints, and Spine. Illustrated with Plates and Woodcuts. By Lionel J. Beale, Surgeon. London, 1830. 8vo. Pp. 248.

Cholera, its Nature, Cause, and Treatment ; with original views, Physiological, Pathological, and Therapeutical, in relation to Fever ; the Action of Poisons on the System, &c. &c. To which is added an Essay on Vital Temperature and Nervous energy ; explanatory more particularly of the Nature, Source, and Distribution of the latter, &c. &c. By Charles Searle, Surgeon of the H. E. I. C. Madras Establishment. London, 1830. 8vo. Pp. 255.

NOTICES TO CORRESPONDENTS.

On the Diseases and Injuries of Arteries, with the Operations required for their Cure ; being the Substance of Lectures delivered in the Theatre of the Royal Coll. of Surg. in the Spring of 1829. By G. J. Guthrie, F. R. S. Professor of Anatomy and Surgery to the R. C. of Surgeons, &c. &c. London, 1830. 8vo. Pp. 416.

Addresses delivered on Various Public Occasions. By John D. Godman, M. D. Professor of Anatomy and Surgery in Rutgers Medical College, &c. &c. With an Appendix, containing a brief explanation of the Injurious Effects of Tight Lacing upon the Organs and Functions of Respiration, Circulation, Digestion, &c. Philadelphia, 1829. 8vo. Pp. 194.

A Letter to William Lawrence, Esq. F. R. S., on the Nature and Causes of Intellectual Life and the Mind. By William Addison, Member of the R. Coll. of Surgeons in London. London, 1830. 8vo. Pp. 35.

Remarks on Nervous and Mental Disorder, with especial reference to recent Investigations on the subject of Insanity. By David Uwins, M. D. London, 1830. 8vo. Pp. 41.

Modern Medicine influenced by Morbid Anatomy : an Oration delivered at the Fifty-seventh Anniversary of the Medical Society of London ; also an Apology for Modern Nomenclature. By Leonard Stewart, M. D. &c. Physician to the Farringdon Dispensary, and Vice-President of the Medical Society of London. London, 1830. Pp. 56.

The Medico-Chirurgical Review, and Journal of Practical Medicine. Edited by James Johnson, M. D. &c. No. 24. April 1830.

The London Medical and Surgical Journal ; including the London Medical Repository, exhibiting a view of the Improvements in the various branches of Medical Science. Nos. 22, 23, and 24, April, May, and June. Edited by Michael Ryan, M. D. &c. London, 1830.

The London Medical Gazette. From March 20th to June 12th. No. 120 to 132. London 1830.

The North American Medical and Surgical Journal. Published under the auspices of the Kappa Lambda Association of the United States. Nos. 17 and 18, January and April 1830. Philadelphia.

Mémorial des Hopitaux du Midi, et de la Clinique de Montpellier. Par le Prof. Delpech. Febrier 1830. No. 2. Mars 1830. No. 15.

The American Journal of the Medical Sciences. No. 10. February 1830. Philadelphia, London, and Paris, 1830.

Journal des Progrès des Sciences et Institutions Médicales. Deuxieme Série, 1830. Tome I. Paris. Bruxelles, 1830. 8vo.

Gazette Médicale de Paris, Journal de Médecine et des Sciences accessoires paroissant tous les Samedis. Numbers 1, 2, 3, 4, 5, 6, and 7.

Plates of the Arteries of the Human Body, from Tiedemann. By E. Mitchell, Engraver, &c. &c. Nos. 7, 8, 9, 10, 11, 12, 13, 14.

Plates of the Nerves, from Scarpa and Walthe. By E. Mitchell, &c. Nos. 7, 8, 9. Edinburgh.

On the 1st of July will be Published the First Number of " The North of England Medical and Surgical Journal, and Topographical and Statistical Record," which will be continued Quarterly. Four numbers will form one octavo volume. Price of each number Three Shillings.

THE
EDINBURGH
MEDICAL AND SURGICAL JOURNAL.

1. JULY 1830.

PART I.
ORIGINAL COMMUNICATIONS.

ART. I.—*Quarterly Report of the Edinburgh Surgical Hospital from March to June 1830.* By JAMES SYME, Esq.
Fellow of the Royal College of Surgeons London and Edinburgh, and Lecturer on Surgery in Edinburgh.

BRACHIAL Aneurism.—In last Report I related the case of William Gillon, in whom the humeral artery was tied on the 5th of February on account of aneurism at the bend of the arm, arising from an injury received in venesection. At that date, (10th February,) the operation promised to be successful, since, though the numbness, and want of pulsation in the aneurism as well as all the arteries of the limb below the ligature did not continue longer than a few hours, the tumour remained free from pain, softer, and smaller. The swelling soon afterwards began to increase; but, as the pulsation became more obscure, we still hoped that a cure would be obtained without any farther operation; and, in order to promote coagulation, the patient had his arm carefully bandaged, was kept quiet in bed, and used a slender diet. At the end of five weeks, however, finding that there was no progress towards improvement, and regretting the long confinement to which there seemed no prospect of a termination, I began to think seriously of performing

2 *Quarterly Report of the Edinburgh Surgical Hospital.*

the radical cure by the old method, and this resolution was suddenly confirmed by an occurrence which took place on the 12th of March. In the site of the lancet wound there had all along been an ulceration about the size of a sixpence, which resisted the means employed to cure it, and sometimes manifested a disposition to slough. During the night of the 11th there was a considerable discharge of bloody serum from this part, and on the following morning, when the bandage was taken off, the bleeding threatened to increase. In these circumstances there could be no doubt as to the impropriety of farther delay, and I therefore laid open the tumour through its whole extent by an incision in the direction of the biceps muscle. A firm hollow fibrous coagulum lining the aneurism and preserving its shape being then removed, a gush of arterial blood flowed from the bottom of the wound. Being unable to control this bleeding by pressing above the aneurism, I pressed the points of both my thumbs down upon the vessel at the part where it had been injured, and then gradually separating them from each other was enabled to discover the wound, which was about a quarter of an inch long, gaping, with thick white lips. My assistant having substituted his thumb for one of mine, I attempted to detach the vessel from its connections; but finding this impossible, owing to the consolidation of all the surrounding tissues, which rendered the coats of the artery quite undistinguishable, I simply passed the needle round it above and below the aperture, so as to convey two ligatures, which being tied, effectually restrained the bleeding. No unfavourable symptom ensued; the ligatures separated on the ninth day; and the patient was dismissed on the 24th.

I have been particular in detailing this case, because I think it ought to have considerable weight in inducing surgeons to abandon the modern operation for aneurism at the bend of the arm. The ligature of the artery above the disease is here particularly difficult, while it may be practised at the seat of the injury without the difficulties that attend such a proceeding in other situations, unless indeed the former method has been tried and failed, when, as in Gillon's case, the want of command over the hemorrhage during the operation, and the condensation of parts occasioned by the longer continuance of the disease, render its performance far from easy.

Aneurism by Anastomosis.—Mrs M., recommended to my care by Dr Spence of Cupar, brought her child, which was 8 months old, to the Hospital as a private patient, on account of a nævus on its cheek. The tumour was situated near the angle of the mouth, and was about the size of a hazel-nut, livid, project-

ing, circumscribed, and nearly circular. At the time of birth it was so small as to be hardly perceptible, but had gradually increased, and was still increasing.

As the tumour did not seem to be confined to the surface of the cutis, excision appeared to be the best mode of removing it, and was accordingly performed by means of a cataract extracting knife,—a very convenient instrument for such delicate operations. The wound healed by the first intention, but opened out again in part, owing to an attack of inflammation caused, or at all events aggravated, by the tenseness of the cheek, and the additional stretching that proceeded from the child's crying. The ulcer was dressed with the acetate of lead lotion, and contracted so much, both in extent and depth, that there could be little, if any, permanent trace of it left.

In the early part of last winter I operated in a similar manner on a disease of the same sort in an infant of the same age, whose case excited a good deal of attention and difference of opinion. The tumour was of the same shape, size, and colour as the one last-mentioned, but was situated near the external angle of the eye. It had increased progressively from the time of birth, when it could hardly be perceived, and was still growing. The risk of hemorrhage and convulsions was urged against any operation, while the great and increasing deformity rendered the parents anxious for some remedy. Drs Abercromby and Davidson were in favour of excision, and I entirely agreed with them as to the propriety of this measure, which was executed with complete success. The diseased structure extended so deeply, that after the bulk of the swelling had been taken away it was necessary to dissect out the remainder with forceps and curved scissors. The wound healed by the first intention, and left no mark whatever.

When the tumour is quite superficial, the best mode of destroying it is to induce ulceration and scabbing. This process frequently occurs spontaneously; and I have remarked, that when the disease exists in several different parts of the same person, if one begins to ulcerate the others soon follow. The same salutary process may be induced by any local irritation, which is sufficient to cause a slight degree of inflammation. The introduction of vaccine matter has been recommended for this purpose, but seems to be objectionable, in respect to natural prejudice, particularly as so many other means of irritation answer equally well. A child was brought to me a few weeks ago, on account of a superficial nævus on the right side of the nose, opposite the angle of the eye; it had increased from the time of birth, and was increasing. I passed a common needle and

4 *Quarterly Report of the Edinburgh Surgical Hospital.*

thread through the disease in its longest direction, and tied the thread so as to prevent it from escaping. No irritation followed immediately, but in a few days the nævus became less vascular, somewhat shrunk, and covered in the centre with a scab. If the process thus commenced does not complete a cure, I shall increase the irritation by applying one or more ligatures.

Fungous Tumour of Mamma.—"Jean Hey, æt. 37, admitted 19th February, on account of a large fungous tumour growing from the upper part of the mamma, not involving the nipple or skin below it, and not seeming to adhere to the subjacent parts. It is of an irregular shape, of a dark-red colour, of a soft consistence, and bleeds freely when touched; the discharge from it is thin, dark-coloured, foetid, and very copious. The patient is extremely emaciated, her countenance is anxious, and her complexion of a remarkable unhealthy looking yellow hue. She has little appetite, and what food she does take is generally rejected by the stomach. She has frequent fits of sickness, which she ascribes to the smell from her breast; she complains much of pain, and passes restless nights. Pulse quick and weak.

"Last May she had an infant seven months old at the breast, and was much confined to the house. She caught cold one day from going out, and was attacked with erysipelas in the face, which went off the following morning. She continued to be sick and squeamish occasionally for six weeks, her appetite being bad, and her thirst great, when she felt a small hard lump just under the nipple of her left breast. It increased in size, the child still continuing to suck, and formed a large elastic swelling, discoloured on the surface, and very painful. After poulticing it for some time, she applied to a surgeon, who made an incision, and evacuated twenty ounces of a dark-coloured foetid fluid, and on two other occasions, within the following ten days, discharged two tea-cupfuls of the same sort of matter. Poultices were again applied, but the pain and discharge continued, and an abscess formed, which being opened in January last, was found to contain six ounces of thick foetid pus. The opening did not close, but the skin, as she described it, began to fall off in small pieces round the wound, while fungous masses at the same time protruded.

"23d. Mr Syme being willing to afford the patient the only chance she had of recovery, proceeded to excise her breast. He included the tumour along with the nipple, within two semilunar incisions; it adhered slightly to the pectoral muscle, and after dissecting it off, he discovered a small round tumour lying under the muscle, which he likewise removed. The edges of the wound

were brought together with some difficulty, owing to the large quantity of skin removed, and retained by means of stitches. She was ordered beef-tea and wine in small and repeated doses. The diseased part being cut through after the operation, exhibited a very characteristic specimen of medullary sarcoma.

" 24th. Has passed a very restless night, having had profuse diarrhœa. She was ordered half-grain opium pills, to be taken according to circumstances; the stitches to be supported by broad pieces of plaster; beef-tea and wine continued. 25th. The diarrhœa ceased after the first pill. She is looking a good deal better; sickness less; pulse stronger; countenance not so anxious.

" March 2d. She is improving rapidly. Her appetite is now pretty good; pulse stronger; wound looking healthy. To have porter.

" 15th. Wound almost completely healed; desires to go home to attend to her family."

I have given this case at full length from the journals of the Hospital, both because the history of it is rather unusual; and because it shows the possibility of complete temporary recovery by operation from apparently the most hopeless cases of this disease. When I was asked to see this poor woman, she was in the most wretched state it is possible to conceive; the air of the room was poisoned with the stench that proceeded from a discharge so copious as to drench her clothes and the bed on which she lay; her stomach rejected food; and her pulse could hardly be felt. The second time I visited her, I found her busy in the performance of domestic duties, strong and active, while the breast was perfectly healed, and apparently free from any disposition to give her farther trouble.* It has long seemed to me that we are in the custom of comprehending under the title of medullary sarcoma, many morbid growths of very different morbid tendency. Some of these tumours never fungate, though allowed to attain a great size; many of them fungate, but never bleed; others manifest the most remarkable hemorrhagic disposition; and there is the greatest variety with respect to their recurrence after removal. Such being the case, it would seem to be our duty, so long as we have not ascertained the distinctive characters, if there be any, of those of a malignant nature, to afford the patient a chance, by performing the operation whenever the whole existing disease can be taken away.

* Since this was written, I have learned that her health is again breaking up.

6 *Quarterly Report of the Edinburgh Surgical Hospital.*

Fungus Hæmatodes of Foot.—Catherine Mean, æt. 46, was admitted 19th April 1830, on account of a large tumour of the foot. It was fully the size of a child's head, was seated on the upper or dorsal aspect, and occupied all the space between the toes and ankle. It had a firm consistence, and was covered with smooth red integument, except at its apex, where several fungous excrescences protruded. The lower part of the leg was somewhat cedematous and inflamed, and she complained of constant pain in the tumour, increased on pressure. She had an unhealthy greenish-yellow complexion, slept ill at night, and showed the other usual indications of disordered health.

Nine years ago she observed a swelling about the size of a pea over the instep. She sometimes felt shooting pains in it, but did not suffer any constant uneasiness until two years ago, when it had gradually attained the size of an egg. Its progress then became more rapid; it inflamed on the surface; so that last February she was induced to apply to a dispensary, where she was advised to use poultices. In the course of a week after, it opened and discharged a large quantity of blood; the fungous growths protruding from the opening. Since then, it has increased rapidly in size, and has of late bled four or five times, about a cupful at once.

I amputated the leg on the 22d, mid-way between the knee and ankle by the flap operation, and the wound healed completely by the first intention, to the surprise of some gentlemen attending the Hospital, who had seen much practice, but never witnessed such an occurrence, (*vide* a paper on the Treatment of Incised Wounds, in this Journal, Vol. xxiv. 52.)

Medullary Sarcoma of Face.—John Mackay, a middle aged man, applied on the 16th of March, on account of a firm circumscribed tumour, the size and shape of the half of a small walnut, which was seated at the inner angle of the eye. It had existed for twelve months, and was immovably attached to the bones below. As it appeared to me that there could be no doubt that this tumour sprung from the bone, I declined interfering with it. I have been told that an operation was performed afterwards by another surgeon in town, and that the disease was found to descend into the cells of the ethmoid bone.

Tumours of Head and Neck.—David Christison, æt. 31, applied on account of several small encysted tumours of the scalp, and a pretty large one at the angle of the jaw. In removing the former, I followed the practice recommended by Mr Copland Hutchinson, of simply running a knife through the swelling in its long direction, and then pulling out the cyst

with a pair of forceps, which not only saves much pain to the patient and trouble to the surgeon, but also lessens the risk of erysipelas that so frequently follows the removal of such tumours by a tedious dissection. The tumour of the neck consisted of a thin cyst containing steatomatous matter, and of course required a careful dissection,—indeed, it is very seldom that the cyst can be pulled out except in the scalp. I succeeded lately in thus extracting a small tumour of this kind from the face of a gentleman, and another from a child; but these must be regarded as exceptions to the general rule.

Tumour of Lip.—Robert Gardner, æt. 35, applied on the 15th of October, on account of a tumour in the upper lip. I punctured it to ascertain the nature of its contents, and, finding that they presented a purulent appearance, concluded that it was merely an abscess, which would require no farther treatment. In April, however, he returned with the swelling as large as before, I, therefore, dissected out the tumour from the inner side, and on cutting it through found it to consist of a thick pulpy cyst, containing a glairy yellow fluid.

Bronchocele.—Two cases of bronchocele lately presented themselves of very similar appearance, but very different nature. One of these was that of Margaret Welsh, æt. 60, recommended by Dr Johnston of Kirkcaldy. She had laboured under the disease for forty years. It had become very distressing, not by interfering with respiration or deglutition, but by impeding the venous circulation of the head, so as to render it necessary for her to be occasionally cupped or leeches on the neck. She has been using an ointment containing the hydriodate of potass, and *Ungt. Hydrarg. Camphorat.*, with much advantage, as has been ascertained by measurement, comparison with a cast, and her own observations. The other case was that of Janet Johnston, æt. 58, from Orkney, who had laboured under the disease for ten years. The tumour here was evidently composed of large cysts, the fluid or semifluid contents of which could be felt distinctly fluctuating. She stated that an opening had once taken place at the centre of the swelling, from which a great discharge escaped, and there was still a long cicatrix, with subjacent induration to be perceived at this part. As it did not appear that this case admitted of any relief, the patient was advised to take the first opportunity of returning home.

Ganglion.—Marion Ross, æt. 23, applied on the 4th of March on account of a large ganglion attached to the ligament of the patella, the size of an orange, which interfered with her walking and other duties as a servant. Being averse to perform, without trial of milder measures, the radical operations of

8 *Quarterly Report of the Edinburgh Surgical Hospital.*

seton, incision, or excision, I simply evacuated the tumour by a small puncture, and applied pressure for a few days, when, finding that the swelling was returning, I applied a blister and then a plaster of camphorated mercurial ointment with iodine ointment. Under this treatment the swelling speedily subsided, and she was dismissed cured on the 17th of March.

Marion Colville, æt. 26, recommended by Dr Pagan, applied with a similar disease, though not nearly to the same extent. I did not think it necessary to puncture, but merely blistered and applied the ointment above-mentioned with the same success.

Johanna Fairley, æt. 39, from Kirkcaldy, applied on the 22d of April on account of a large tuberculated ganglion about the size of a pigeon's egg, which was seated on the back of the hand near the wrist, over the extensor tendons of the fore-finger. She had laboured under this disease for five years, and had it evacuated, &c. but was at length suffering so much, that she had made up her mind to be radically cured. I dissected out the tumour, which was composed of a very thin cyst containing the usual glairy substance, and adhering so intimately to the tendons above-mentioned, that it was necessary to insulate them completely for a considerable part of their course. The patient had frequent rigors, with considerable constitutional disturbance, with slight erysipelas of the affected hand, but recovered very well under the use of the tartrate of antimony and acetate of lead poultices.

Ulcers.—It will be seen from the list of cases, that a very great number have been treated at the Hospital. In a former Report, I entered very fully into the consideration of those which are usually styled callous or indolent, and which constitute a very large proportion of the ulcers that are met with in the lower orders. Some have attempted to depreciate the new treatment by blisters which I have proposed for this sort of ulcer, not on the ground of its inefficiency, but because it will not prevent a recurrence of the disease. I know very well that there is often a strong disposition to ulceration of the legs in certain constitutions, and at certain periods of life. I believe that proper precautions, local and general, may frequently prevent this disposition from causing a relapse, but this is more a subject of physic than surgery; and the question that concerns us is, what means are most effectual and speedy for promoting the healing of indolent ulcers? When there is much swelling of the limb,—when the edges of the ulcer are deep and callous,—and when the constitution of the patient is not particularly irritable, the effect of a blister is quite astonishing. In three days

or sometimes less, the surface of the ulcer is much diminished in extent, and on a level with the surrounding skin. Cicatrization then commences, and rapidly extends and completes the cure much more quickly than I have ever seen it accomplished even by the most careful execution of Mr Baynton's method, which of all the others which have hitherto been recommended is certainly the most efficacious.

There have been several cases of a sort of ulceration which presents very distinct characters, and yields readily to a particular mode of treatment. The ulcers I allude to are usually numerous, existing on the instep and lower part of the leg, and also on the back of the hand and arm. They are very superficial, of a circular or crescentic form, and of a grayish or yellow colour, with abrupt edges. They are sometimes painful, sometimes not. These ulcers are very obstinate, unless subjected to the black wash, under which they heal very speedily. I usually give a small quantity of mercury internally, either the blue pill or the oxymuriate, along with sulphate of magnesia. It is worthy of notice, that the mode of cicatrization constitutes one of the most characteristic features in this kind of ulcer. The cicatrix does not extend equally round the circumference, but beginning at one part, the concave part if the ulcer be crescentic, it shoots inwards towards the centre, and then spreads outwards to the remaining circumference.

Ulcer of Great Toe.—The case of James Hume, æt. 21, presented an instance of that very common and distressing ulcer which is usually ascribed to inversion of the nail. The application of caustics to destroy the morbid sensibility of the irritable surface, and interposition of various protecting matters between it and the edge of the nail, and even the free excision of all the overlapping fold of skin, afford little temporary, and no permanent relief, and I have actually known amputation of the toe recommended as the only remedy for this apparently trifling, but most annoying complaint. M. Dupuytren is entitled to much gratitude from persons thus afflicted, for devising an easy and effectual mode of relieving them, viz. removal of the nail in whole or in part. This may appear a very difficult and painful operation, but is neither one nor other if properly performed. One of the blades of strong sharp-pointed scissors should be pushed upwards close under the nail to its root, to which extent it is then to be divided at one stroke, when one of the portions being seized firmly with a pair of dissecting forceps, may be easily extracted in a lateral direction, and then the other, if it is deemed necessary to remove the whole nail, which, however, is seldom the case. In the present instance, the patient had laboured for nearly two years under this distressing affliction, which

10 *Quarterly Report of the Edinburgh Surgical Hospital.*

rendered him very lame. He was treated in the way described with perfect success.

Lithotomy.—George Calder, æt. 13, applied on account of pain in making water, with frequent desire to do so, under which complaints he had laboured more or less for eleven years. I sounded him and detected a stone. I performed the usual operation on the 16th of March, and extracted a very large mulberry calculus, the largest and roughest that either I or any of the gentlemen present had ever seen. The patient suffered no unpleasant symptom after the operation, except a pretty copious secretion of mucus, and deposition of an ammoniaco-magnesian phosphate between the lips of the wound. He was dismissed cured on the 4th of May.

In this case, the first thing deserving of notice was the small inconvenience suffered by the patient from so large and rough a stone; the best proof of which is, that he had lived eleven years in Edinburgh, where surgical assistance is so readily obtained, without ever having it required for him. It is a curious but well-ascertained fact, that the severity of calculous symptoms is always in direct proportion to the derangement of the urinary secretion; and this is probably the reason that the mulberry calculus, which is attended with very little alteration of the urine, occasions less distress than any other, though its distinguishing roughness would seem to render it the most irritating of the whole. The second remarkable circumstance, is the deposition of the triple phosphate, which accompanied the increased secretion of mucus, appearing when it commenced, and ceasing when it stopped upon the closure of the wound. There was here a good illustration of the mode in which calculi are so frequently encrusted with the triple phosphate, in persons who have suffered great irritation from the disease. The excess of mucus secreted by the excited bladder promotes the putrefactive tendency of the urine, which converting the urea into carbonate of ammonia, thus occasions the precipitate in question.

Mr S., æt. 55, was recommended to my care by Dr Mitchell of Ellom, Aberdeenshire, on account of stone in the bladder, and entered the Hospital as a private patient on the 28th of April.

On the 1st of May I extracted a very large flat-shaped triangular calculus, composed of uric acid; and weighing nearly four ounces. The urine came away freely. The patient made no complaint of pain in the region of the bladder; never felt the slightest tenderness on pressure in the hypogastric region, or any other part of the abdomen; but he began soon after the operation to complain of sickness, thirst, and restlessness, with

a quick pulse and parched red tongue. He continued in this state, gradually becoming weaker until the 14th day, when he died. We found on dissection a diffused suppuration in the cellular substance exterior to the left side of the bladder. In each kidney there was a calculus composed of uric acid.

Since the date of last Report, some cases of lithotomy have occurred in my private practice which seem deserving of notice. Mr George White asked me to assist him in the removal of a stone from the bladder of Mrs —, a middle-aged female, who had been long confined to bed from other causes, and severely tormented with the usual symptoms of calculus. Mr White had found the parts unable to bear the irritation of sponge-tent; and by means of the simple dilating instrument which I have described in a former Number of this Journal, widened the urethra considerably, but not so much as was required, owing to the insufferable distress experienced by the patient when he attempted to do so. Having introduced my finger, I ascertained that the resistance to farther dilatation was seated at the neck of the bladder; and, therefore, introducing a straight blunt-pointed bistoury, made some small incisions at this part, upwards and laterally, and then extracted two large stones. The patient did well.

Mr M., æt. 60, came from Berwickshire to town in the beginning of April, on account of stone in the bladder, from the symptoms of which he had suffered to an excessive degree for several years; indeed, he had not been free from gravelly complaints for the long period of fifteen years. His sufferings were unusually constant and severe. Motion of any sort was particularly distressing, and could be tolerated only when he stooped forwards; and, in these circumstances, his long journey of sixty miles could hardly have been performed by one less resolute than himself; but he was determined to be relieved; and though his friends considered his return alive as nearly hopeless, he accomplished the undertaking by travelling in a carriage of his own, which was fitted up with straps, that enabled him to stand constantly stooping forwards, the only posture, as already mentioned, in which he could bear to be moved. When he arrived, I certainly considered him a most unfavourable subject for the operation. He was excessively corpulent. His tongue was red and dry, and his thirst constant. In performing the operation, the first difficulty encountered was presented by the unwieldiness of the patient, whose limbs could by no means be approximated, so as to admit of being secured in the usual way. Having cut into the bladder, I extracted two small stones and two larger ones, the size and shape of pigeons' eggs. In order to ascertain if any more still

12 Quarterly Report of the Edinburgh Surgical Hospital.

remained, I searched carefully with a curved staff; and finding it strike against another behind the pubes, I endeavoured to perform extraction with straight and curved forceps. But the extreme thickness of parts, and the consequent depth of the wound, prevented me from depressing the handles of the instruments sufficiently to lay hold of the stone, or indeed even to touch it; and some attempts to dislodge it, by means of curved scoops having proved equally unsuccessful, I resolved, though no advocate for the operation *en deux temps*, to postpone any further proceedings for removal, until there was reason to suppose that the stone had shifted into a more favourable position.

The patient made no complaint whatever after the operation; and the tube for allowing the urine to escape being withdrawn two days afterwards, I searched for the stone but without success; and it was not until the second day following that I could bring an instrument into contact with it. It now lay more favourably for extraction, though still very deep, viz. nine inches by measurement from the mouth of the wound. Having laid hold of it with a pair of forceps, I extracted with great ease a stone similar in shape, but intermediate in size to the two larger ones formerly taken out. The patient made a good recovery, and was walking abroad on the fourteenth day after the operation. He has returned home perfectly well.

On the 20th of April I was requested by Dr Barker to operate on Mr R., æt. 70, who had suffered from stone for two or three years.

Having cut into the bladder, I introduced my finger, and felt, instead of the cavity, a large round tumour the size of an egg, which I recognized as an enlargement of what is called the middle lobe of the prostate. By means of a straight bistoury, I cut through this swelling sufficiently to admit the forceps, and then attempted to lay hold of the stone; but found it impossible to do so until the patient's breech was sufficiently elevated to let it escape from the pouch, in which it lay behind the enlarged prostate. For the first three days after the operation the patient did well, with the exception of complaining almost constantly of a severe pain at the point of the penis. During the fourth night, having got out of bed to go to stool, he suffered a profuse hemorrhage from the wound, which exhausted him very much for the time. He rallied, however, and gave us hopes of his ultimate recovery; but his strength gradually declined, his stomach being extremely irritable, so as to prevent the reception of any support; and he died a fortnight after the operation. On dissection, there was not the slightest trace of disease in the cavities either

of the abdomen or pelvis. Neither was there any appearance of inflammation in the bladder; and the only part which seemed to suffer from disease was the prostate, which was greatly enlarged throughout, but especially upwards towards the cavity of the bladder.

Hydrocele.—In the last Report, I mentioned the case of John Bryce, who had a hydrocele injected, and in consequence suffered an extensive sloughing of the scrotum, though the wine had been retained a very short time from the apprehension of such an occurrence, owing to the irritability of the patient, which his appearance strongly indicated. The cure, though delayed on this account, was satisfactorily completed, and he was dismissed on the 14th of March.

The cases of Alexander Mackenzie, who was operated upon on the 16th of February, and Robert Glassil on the 11th of April, presented nothing remarkable either in the appearance of the disease or in the result of the operation; but that of Finlay Thomson, æt. 58, admitted on the 30th of March, was deserving of notice, from the very unusual shape and situation of the swelling, which completely resembled an inguinal hernia. The testicle being at the bottom of the tumour could be felt distinctly on all sides, so that there is reason to believe the water did not lie in the cavity of the tunica vaginalis, but in the chord. I drew off the water, and threw in the usual injection, but did not allow it to remain above two minutes, as the patient complained severely of pain. Little inflammation followed, and I applied one or two blisters, which seemed to have a good effect in promoting the absorption of the fluid that was subsequently effused. He was dismissed with little remains of the swelling, and was instructed to return if it increased, to have the operation repeated, when he might depend upon its being effectual, as the previous trial would warrant a more severe irritation.

There is at present in the Hospital a case of hydrocele, rather interesting in respect to its origin and diagnosis. James Baptie, æt. $2\frac{1}{2}$, had a congenital inguinal hernia, which was easily reducible until some months ago, when he was attacked with scarlet fever and lay six weeks in bed. Upon his recovery the swelling was observed to be irreducible, and he was brought to me for advice as to what was to be done. On examination I ascertained that the tunica vaginalis, instead of containing intestine, as it had formerly done, was now only distended with fluid. The water has been drawn off, and if it re-accumulates, the operation for the radical cure by injection will be performed.

14 *Quarterly Report of the Edinburgh Surgical Hospital.*

I may take this opportunity of remarking, that it is not very uncommon to meet with hernia humoralis or swelled testicle in infants and children of tender age. This fact is important in respect to the diagnosis of complaints in this situation, since surgeons unacquainted with it might be led to suppose that a non-fluctuating tumour of the scrotum at this early age must depend on a hernia. I have more than once been consulted in cases where rupture bandages had been prescribed for the complaint in question.

Extirpation of the Testicle.—James Gray, æt. 22, was admitted 5th March, on account of an extensive sinus, with swelling and great induration of the right epididymis. The complaint had existed for eighteen months, and had resisted the ordinary measures of cure. I dilated the sinus freely, and ordered camphorated mercurial ointment to be rubbed over the swelling, and sulphate of zinc wash to the sore. A succession of abscesses followed; the patient became weaker and weaker; and the sinuses which were successively laid open almost insulated the testicle. In these circumstances, as the organ could not be supposed capable of performing any useful function even if preserved, its extirpation was proposed to the patient and readily agreed to. It was performed on the 6th of April, and the patient was dismissed cured on the 24th.

In performing castration, the great apprehension usually entertained is retraction of the arteries, which is generally attributed to the action of the cremaster muscle. But a little reflection as to the origin of this muscle must be sufficiently convincing that it cannot perform the effect in question, which is plainly owing to the elasticity of the vessels themselves. Whenever, therefore, there is reason to suppose, from the bulk of the swelling, that the arteries have been subjected to much extension, the surgeon ought to provide a steady and intelligent assistant for holding the chord after its division until the vessels are secured. The more skin that is taken away the better, provided enough is left to allow the edges of the wound to be brought into contact, since the risk of bloody and purulent collections is thus greatly lessened.

Stricture of the Urethra.—George Cockburn, æt. 32, who was mentioned in the last Report as having applied on account of retention of urine, owing to a very tight stricture of the urethra, was cured by the successive introduction of gradually enlarged steel bougies.

Alexander Geddes, æt. 45, applied on the 25th of March, on account of a large swelling of the right testicle. Being questioned as to his powers of making water, he stated that the

stream was very small, and could not be projected above a couple of inches from the orifice of the urethra; that he had frequent desire to empty his bladder, and considerable difficulty in doing so. On examination, three strictures were discovered, one at the neck of the glans, one where the penis becomes pendulous, and one at the bulb. The usual practice was followed with complete success,—indeed, the swelling of the testicle had nearly disappeared by the time that the urethra was so far dilated as to admit No. 1, and he now makes water with perfect freedom.

Charles Dickie, æt. 40, applied on the 26th of April, on account of the following urinary complaints. He could not pass his water but in drops; he could not arrest its flow when it had once commenced; and the prepuce was excoriated from the almost constant irritation of its presence. I found the urethra very much contracted, hardened, and irregular, but by using the means already mentioned, dismissed him completely cured, so far as regarded his unpleasant symptoms, and merely requiring to return occasionally for a week or two longer, to have the urethra dilated to its full extent.

Samuel Pringle, aged 53, applied on the 17th of February, on account of fistula in perinæo, attended with great thickening, and almost cartilaginous hardness of the parts concerned. Most of his urine passed through this aperture, and he was suffering much from the formation of an abscess in the neighbourhood. The complaint had existed for upwards of nine years, and was very distressing, especially when new abscesses formed, which was not unfrequently the case. I found a very tight stricture near the bulb, and as he lived at some miles distance in the country, took him into the house to make his cure more safe and certain. The swelling and induration of the perinæum disappeared before the bougie had been introduced many times, but the fistulous opening, though it speedily contracted, was not obliterated so soon as it would have been in a case of more recent standing. He was dismissed on the 19th of March, making his water in a full stream, having no uneasiness in the perinæum, but still passing a drop or two of urine through the fistula. He has returned since quite free from any complaint.

Fistula Lacrymalis.—Jean Thomson, aged 51, was admitted on the 1st of March, on account of a fistula lacrymalis, which had existed twelve months. There was considerable swelling and hardness round the opening, and a troublesome watering of the eye.

I pushed a knife into the duct, and introduced a style, which at first occasioned a good deal of irritation, and was subse-

16 *Quarterly Report of the Edinburgh Surgical Hospital.*

quently worn without any inconvenience. The patient was dismissed on the 22d of April, with instructions to retain the style in its place for some time longer. She returned in about a fortnight, and stated that it having come out a few days before, she could not introduce it, but felt no reason to regret its absence, as the cure seemed quite complete.

Stricture of Rectum.—In last Report I mentioned the case of Robina Wright, who had laboured long under stricture of the rectum and recto-vaginal fistula. From the relief that attended the commencement of her treatment, I expected to have been able to complete the cure; but though freed from the incontinence of fæces, and greatly relieved as to the pain and frequency of these evacuations, she continued to suffer from a very copious discharge of mucus and pus, which made me suspect some incurable disease farther up the intestine, and she was therefore dismissed on the 24th of March.

Stricture of the Œsophagus.—The case of David Allan, æt. 49, from Arbroath, at present in the Hospital, is in some respects similar to the one last mentioned. He was treated at home by my friend and pupil Mr J. Trail, for a very tight stricture of the Œsophagus, the date of which he referred to last November. The bougies at first introduced were not so large as a common quill, and yet distended the canal so fully, as to render their extraction difficult. The size was gradually increased to three-eighths of an inch in diameter, when, not finding much relief from the symptoms of his complaint, he came to town and was admitted into the Hospital. On examination, I found the stricture in the thoracic portion of the Œsophagus, and passed a moderate sized bougie very easily through it. The little relief experienced by the patient from the very considerable dilatation which had already been effected, and the irritability of stomach indicated by frequent ejections of the matters introduced into it, led me to suspect that there was disease of structure as well as stricture. Dr Abercrombie has recommended small doses of the oxide of bismuth with aloes, or some other gentle cathartic, and counter irritation during the fits of aggravation which the patient occasionally suffers.

Excision of Elbow-joint.—In last Report I stated that James Alexander, æt. 9, from Arbroath, had entered the Hospital on account of a diseased elbow-joint, which seemed to be a proper subject for excision.

I performed the operation in the manner already described, and found that the disease was seated in the extremity of the humerus; but having occasion in removing it to cut into the

joint, I deemed it prudent to take away the articulating surfaces that remained, in order to prevent the inflammation in the first instance, and caries in the second, that might result from their being left.

The patient recovered extremely well and speedily from the operation; but when almost quite well, and just about to be dismissed from the Hospital, he fell into a bad state of health, one effect of which was a superficial ulcer over the external condyle of the humerus that proved extremely obstinate, and yielded only to time, together with an alterative course of blue pill and sarsaparilla. He was dismissed cured on the 6th of May.

Morbus Coxarius.—There have been several cases illustrative of the good effects of the actual cautery in curing this formidable disease,—it may be sufficient to mention the particulars of one.

George Hutchinson, æt. 15, admitted on the 24th of March. He complains of pain in his left hip and knee, particularly when walking. His left hip is more flattened, appears longer, and its lower edge does not form such a bold line as in the other. The pain is worst during the night.

Six weeks ago he fell upon the ice and hurt his left hip; it was very painful after the accident, but he continued to work till last week, when the pain felt at the hip and knee in walking was so great, as to confine him to the house. When he sits down after walking, it is often so severe as to prevent him from rising again.

25th, To-day the actual cautery was applied to the space immediately behind the trochanter major.

26th, He has no pain, and feels almost quite well. To have a poultice applied.

28th, To-day the slough separated, the sore is much larger than the part burned; he has no pain; sleeps well; has a good appetite. Simple ointment applied.

April 7th, The sore continues to discharge; he has no pain now even when walking.

30th, To-day he was discharged, to attend as an out-patient; he has no pain, and only complains of a little stiffness when he straightens the limb in bed.

The following case is very interesting, as affording some information with respect to this mysterious affection, at a stage of its progress when it is rare to obtain an opportunity of dissection.

James White, æt. 14, Torwood, Stirlingshire, admitted on the 11th of March. His right leg is shortened and turned inwards; the head of the femur is dislocated upon the dorsum of

18 *Quarterly Report of the Edinburgh Surgical Hospital.*

the ileum, the trochanter major projects more than the other, and is nearer the crest of the ileum. The pelvis is twisted, the affected side being considerably higher than the other; the right thigh is emaciated. The motions of the hip-joint are much impeded; the limb cannot be straightened; his appetite is bad; he has frequent fits of sickness, and sometimes night sweats.

Last autumn he received a kick on his right hip, after which he went about in his usual way, but always complained a little of pain in the joint, worst during the night. He could not rest so much on that leg as on the other. Nothing was done for his relief till a month or two after the injury, when poultices were applied, stimulating frictions used, and blisters, without any benefit. The pain gradually increased, so that at last he was unable to use the limb.

15th. No change took place till this evening, when he complained of headach. About seven o'clock he became delirious. He worked insensibly with the bed-clothes. He was bled to $\frac{3}{4}$ xxii. Two turpentine injections were given him, which operated well, and eight grains of calomel. Leeches were applied to his forehead; and the head was kept cool by the application of ice. Soon after he was seized with violent convulsions; during which he ground his teeth, clenched his fists, and squinted with both eyes; his tongue hung out at his mouth, so that he could scarcely be prevented from biting it; his mouth was twisted to one side; his eyes were not sensible to light; his carotids throbbed violently; and the jugular veins were distended with blood. His pulse during the paroxysms varied from 100 to 130 in the minute. His feet were warm; heat of body natural; face sometimes flushed, at other times pale. A blister was applied to each thigh, and a sinapism to the epigastric region. At twelve o'clock he became comatose, and his pulse sunk to 80.

16th, He is still insensible; his eyes are kept shut. Two blisters to be applied to the thighs, and one to the head. Pulse natural.

17th, He opens his eyes when spoken to, and answers by nods. Seven grains of calomel ordered, and a turpentine injection, which operated. Another blister to be applied to the head.

18th, Not so well; eyes glazed.

20th, He answers by signs, and attempts to speak, but is unable. His mouth is drawn to the right side. When food is offered him, he opens his mouth to receive it. Pulse weaker. Wine ordered.

22d, This morning he was quite insensible; and at nine o'clock he died.

It appears that before leaving home he had been observed to be listless and drowsy, and otherwise disordered, as is usual at the commencement of hydrocephalus. And when he entered the Hospital, I was struck with the extreme stupidity and indifference of his manner, which I attributed to natural defect.

It is, I believe, thought by physicians, that the fluid in this disease is secreted as a consequence of the inflammation; but it appears to me more probable that the fluid, being gradually effused, causes the stupor that is observed in the first instance, and then inflammation by the irritation of its pressure, while the convulsions, rigid palsy, and death, are owing to this morbid action affecting the cerebral substance. I venture, with all deference, to offer this explanation of the extreme obstinacy which characterizes acute hydrocephalus,—an obstinacy much greater than that of inflammation of the brain, or any other organ where it is not kept up by local irritation.

On dissection, the capsular ligament was found greatly distended, but quite entire, with the exception of a small aperture under the *psoas magnus* and *iliacus internus*, which afforded a communication between the cavity of the joint, and a large abscess extending up along the former of these muscles. The articular cartilage was every where completely sound; but the acetabulum, at the part where it receives the attachment of the triangular ligament, was carious and bare on both surfaces, to the extent of about a sixpence. There was no trace of the triangular ligament. The thin and distended capsule permitted the subluxation of the femur, which had been observed during life, and accounted for the shortening of the limb, which still remained after death. The synovial membrane lining the capsule, the neck, and part of the head of the femur, had undergone what is usually called the scrofulous degeneration, and was converted into a grayish-brown pulp.

Dislocation of the Wrist.—My pupils confidently assure me that they reduced two cases of dislocated wrist; and I have no reason to doubt the accuracy of their statement, except the extreme rarity of the accident in question; but there was one case which occurred lately, seen both by Dr Ballingall and myself, that I am able to report without any hesitation. The patient was a young man, who fell on the palm of his hand, and in consequence sustained a dislocation of the carpus backwards. The bones were easily replaced by extension and coaptation.

Fractured Radius.—There was a case of fractured radius close to its carpal extremity in a boy, that simulated very closely the appearance of dislocation, as the detached portion

20 *Quarterly Report of the Edinburgh Surgical Hospital.*

was turned backwards and fixed so firmly as to require very considerable force for its replacement.

Fractured Tibia.—In last Report, I mentioned the curious fact, that six cases of the tibia fractured alone had occurred since the Hospital was opened. Within the last quarter a seventh instance of this usually reputed rare accident was presented by Charles Smith, æt. 9, who fell from the top of a high wall, in endeavouring to escape from a policeman.

Compound Fracture of Thigh.—"John M'Donald, æt. 40, carpenter, Newhaven, admitted 29th March, states that in April 1826, he fell off the gangway into the Dry Dock at Leith, and fractured his right thigh bone. The lower portion of the femur was forced through the skin and clothes, and remained there for about half an hour. He was carried to the infirmary of this place, where he lay for eighteen weeks; at the end of which he went home, the bone being firm, but the wound still discharging about a pint a-day. It healed up at last, but soon broke out again, and continued to heal up and break out alternately till last summer, when an abscess formed, which he opened with a razor, and picked out two small pieces of bone. He then applied to several practitioners, all of whom said that nothing could be done for him,—indeed one went so far as to ask him for his leg when he died. It has continued open since then.

"At present there is, about three inches below the trochanter major of his right thigh, a sinus leading down to the femur, at the bottom of which a piece of bone can be felt bare and loose. The limb is a good deal shortened; the thigh is enlarged. He frequently feels a prickling pain in his thigh when he moves it.

"30th, To-day Mr Syme enlarged the opening and extracted with a pair of forceps a piece of bone about one inch and a-half long and half an inch broad. The one side presented a smooth surface similar to that of the femur, the other a ragged one, as if it had been removed by absorption. The wound was dressed with dry caddis.

"31st, The wound has a healthy appearance; its edges are a little hard. Poultice ordered.

"April 2d, Sulphate of zinc wash applied. The wound is rapidly contracting; no pain.

"7th, He was dismissed."

Rickets.—This is a very common complaint in Edinburgh, particularly among the ill-fed sickly children of the poor people, but seldom goes so great a length as to terminate fatally. The clavicles, ribs, and inferior extremities suffer more or less distortion; the countenance is pale and tumid; and there is relaxation of the muscles and integuments. Small doses of calomel and rhubarb, warm bathing, frictions over the whole body, and the horizontal posture, are the means employed for remedying

the disease, and usually prove sufficient. Sometimes the patients die from other diseases, and then afford an opportunity of examining the state of the osseous system.

William Forbes, æt. 2½ applied on the 9th of March, labouring under the ordinary symptoms of rickets. The clavicles were bent to a right angle, and the thigh bones were so flexible that they appeared to have a false joint about their middle. The mother stated that the bones had been broken from slight falls, and had not united. I observed to the gentlemen present, that I had met with this occurrence in respect to the humerus, of which there are two in my possession, and that the flexibility was owing not to want of union, but to its being effected by means of cartilage. The child died soon afterwards from some affection of the head, and I have got the femurs, in each of which there is a large mass of cartilage at the seat of the fracture.

As a year has now elapsed since the Surgical Hospital was opened for the reception of patients, I think it right to subjoin a general statement of the cases that have come under treatment, in order to give some idea of the relief and instruction afforded by this institution, or rather which is likely to be afforded by it when established by the experience of years in the confidence of the public.

It will be observed, that 1900 cases of surgical disease have been presented for relief—that 265 of these have been admitted into the house—and that 95 operations have been performed.

OUT-PATIENTS.

| | | | |
|-----------------------------|-----|------------------------------------|--------|
| Abscesses, | 97 | Caries of knee-joint, | 5 |
| Abscess in epididymis, | 1 | ———— ankle-joint, | 9 |
| Amaurosis, | 3 | ———— foot, | 1 |
| Aneurism of carotid artery, | 1 | ———— metatarsus, | 3 |
| ———— humeral, | 1 | ———— great toe, | 2 |
| ———— by anastomosis, | 1 | Cataract, | 10 |
| Anthrax, | 13 | Catarrh of bladder, | 1 |
| Aphthæ of gums, | 11 | Chemosia, | 1 |
| Bronchocele, | 4 | Chilblains, | 3 |
| Bruises, | 185 | Chopped lips, | 5 |
| Bunion, | 2 | Club-foot, | 2 |
| Burns, | 31 | Concussion of brain, | 2 |
| Calculus in bladder, | 4 | Curvature of spine, | 3 |
| Cancer of mamma, | 5 | Cutaneous disease, | 146 |
| ———— neck of uterus, | 1 | Cut throat, | 1 |
| ———— tongue, | 1 | Deafness from accumulation of wax, | 8 |
| ———— lip, | 3 | Diseased teeth extracted, | 52 |
| ———— scrotum, | 1 | Dislocation of jaw, | 1 |
| Cancerous ulcers, | 5 | ———— humerus, | 6 |
| Cancerum oris, | 1 | ———— elbow, | 1 |
| Caries of elbow-joint, | 10 | ———— wrist, | 3 |
| ———— olecranon, | 2 | ———— thumb, | 1 |
| ———— wrist, | 4 | ———— finger, | 1 |
| ———— thumb, | 2 | ———— femur, | 3 old. |
| ———— fingers, | 2 | ———— patella, | 1 old. |

22 Quarterly Report of the Edinburgh Surgical Hospital.

| | | | |
|---|--------|--|--------|
| Dislocation of ankle, | 1 old. | Irritable tubercle of mamma, | 1 |
| Ectropium, | 1 | ----- testicle, | 1 |
| Effusion into knee-joint, | 5 | Medullary sarcoma of thigh, | 1 |
| ----- bursa, | 12 | ----- fore-arm, | 1 |
| ----- cellular substance, | 12 | ----- face, | 1 |
| Enlarged tibia, | 14 | Morbus coxarius, | 16 |
| ----- glands, | 39 | Necrosis, | 9 |
| Epistaxis, | 1 | Nephritis, | 1 |
| Erysipelas, | 24 | Omalgia, | 2 |
| Exfoliations, | 6 | Ophthalmia, | 80 |
| Furunculus, | 24 | Otorrhœa, | 8 |
| Fissure in hard palate, | 1 | Osteo-sarcoma of superior maxilla, | 1 |
| Fistula lachrymalis, | 3 | Paraphymosis, | 2 |
| ----- in ano, | 10 | Partial paralysis, | 18 |
| Foreign bodies extracted from hands and feet, | 8 | Periostitis, | 13 |
| Fracture of cranium, 1 old, | 1 | Phymosis, | 1 |
| ----- ossa nasi, | 1 | Poisoning, | 1 |
| ----- ribs, | 15 | Polypus nasi, | 3 |
| ----- clavicle, | 9 | ----- auris, | 1 |
| ----- humerus, | 12 | Prolapsus ani, | 4 |
| ----- olecranon, 1 old, | 2 | Pterygium, | 1 |
| ----- ulna and radius, | 2 | Rachitis, | 9 |
| ----- radius, 1 old, | 8 | Retention of urine, | 5 |
| ----- ulna, | 1 old. | Rheumatism, | 62 |
| ----- metacarpus, | 2 | Rupture of muscular fibres, | 4 |
| ----- phalanges, | 1 | ----- tendo Achillis, | 2 old. |
| ----- do. compound, | 1 | Sciatica, | 8 |
| ----- femur, | 7 | Scirrhus of mamma, | 2 |
| ----- patella, | 1 old. | Short frœnum, | 2 |
| ----- tibia and fibula, | 3 | Sinuses, | 21 |
| ----- do. do. compound, | 1 | Sore throat, | 26 |
| ----- tibia, | 7 | Spina ventosa of metacarpus, | 3 |
| ----- fibula, | 4 | Sprains, | 86 |
| Fungus hæmatodes of mamma, | 1 | Stricture of œsophagus, | 1 |
| ----- foot, | 1 | ----- rectum with recto-vaginal fistula, | 1 |
| Fungus of testicle, | 1 | ----- urethra with fistula in pe- | |
| Ganglion, | 4 | ----- rinæo, | 2 |
| Gonorrhœa, | 18 | ----- urethra, | 9 |
| Hæmatocele, | 2 | Syphilis, | 20 |
| Hare lip, | 2 | Tic Douloureux, | 3 |
| Hæmorrhoids, | 8 | Tumours, | 22 |
| Hernia reducible, | 16 | Ulcers, | 265 |
| ----- strangulated, | 1 | Ulcerated cartilages of knee-joint, | 3 |
| ----- cerebri, | 1 | ----- ankle, | 1 |
| ----- humoralis, | 12 | Varicose veins, | 12 |
| Horn on lip, | 1 | Vertebral diseases, | 12 |
| Hydrocele, | 9 | Warty excrescences, | 6 |
| Hypospadias, | 3 | Weakness of lower extremities, | 10 |
| Incontinence of urine, | 8 | Whitlow, | 21 |
| Inflammation of veins, | 9 | Wounds incised, | 41 |
| ----- absorbents, | 3 | ----- punctured, | 22 |
| ----- joints, | 15 | ----- lacerated, | 30 |
| Inversion of toe nail, | 1 | Wry neck, | 1 |
| Iritis, | 5 | | |
| | | | 1900 |

IN-PATIENTS.

| | | | |
|----------------------------------|---|---------------------------------------|---|
| Abscesses, | 7 | Aneurism of carotid artery, | 1 |
| ----- of mamma, | 4 | ----- humeral, | 1 |
| Abscess in epididymis, | 1 | ----- by anastomosis, | 1 |
| Amaurosis, | 1 | Bronchocele, | 2 |

Quarterly Report of the Edinburgh Surgical Hospital. 23

| | | | |
|--|-------|--|----|
| Bruises, | 10 | Hæmatocelc, | 2 |
| Bunion, | 1 | Hemorrhoids, | 1 |
| Burns, | 4 | Hernia strangulated, | 1 |
| Calculus in bladder, | 4 | humoralis, | 1 |
| Cancer of mamma, | 2 | Hydrocele, | 6 |
| scrotum, | 1 | Hypospadias, | 1 |
| Cancerous ulcers, | 1 | Inflammation of veins, | 2 |
| Caries of elbow-joint, | 5 | joints, | 1 |
| humerus, | 1 | Inflamed tibia, | 1 |
| olecranon, | 2 | Iritis, | 1 |
| wrist, | 2 | Irritable tubercle of mamma, | 1 |
| thumb, | 1 | Medullary sarcoma of thigh, | 1 |
| knee-joint, | 2 | face, | 1 |
| ankle-joint, | 3 | Morbus coxarius, | 6 |
| foot, | 3 | Necrosis of rib, | 1 |
| great toe, | 2 | femur, | 1 |
| Cataract, | 1 | Nephritis, | 1 |
| Catarrh of bladder, | 1 | Omalgia, | 2 |
| Concussion of brain, | 2 | Ophthalmia, | 3 |
| Cut throat, | 1 | Osteo-sarcoma of superior maxilla, | 1 |
| Dislocation of humerus, | 2 | Ovarian tumour, | 2 |
| femur, | 1 old | Partial paralysis, | 1 |
| Effusion into knee-joint, | 2 | Paralysis of bladder, | 1 |
| bursæ, | 2 | Periostitis, | 1 |
| Enlarged glands, | 2 | Poisoning, | 1 |
| tonsils, | 2 | Phrenitis, | 1 |
| Erysipelas, | 2 | Prolapsus ani, | 2 |
| phlegmonous, | 3 | Pterygium, | 1 |
| Excoriations of anus, | 1 | Rupture of muscular fibre, | 1 |
| Exfoliations, | 2 | Scirrhus of mamma, | 1 |
| Forunculus, | 1 | Sinuses, | 5 |
| Fissure in hard palate, | 1 | Sprain, | 1 |
| Fistula lachrymalis, | 1 | Stricture of œsophagus, | 1 |
| in ano, | 4 | rectum, with recto-vaginal | |
| Fracture of ribs with emphysema, | 2 | fistula, | 1 |
| clavicle, | 2 | urethra, with fistula in pe- | |
| humerus, | 7 | rinæo, | 2 |
| olecranon, | 1 | urethra, | 4 |
| radius, | 2 | Syphilis, | 4 |
| phalanges compound, | 1 | Tic Douloureux, | 1 |
| femur, | 5 | Tumours, | 5 |
| tibia and fibula, | 4 | Ulcers, | 40 |
| tibia and fibula compound, | 1 | Ulcerated cartilages of ankle, | 2 |
| tibia, | 7 | Vertebral disease, | 2 |
| fibula, | 2 | Warty excrescences, | 5 |
| Fungus hæmatodes of mamma, | 1 | Whitlow, | 4 |
| foot, | 1 | Wounds incised, | 3 |
| Fungus of testicle, | 1 | punctured, | 3 |
| Ganglion, | 1 | lacerated, | 4 |

265

OPERATIONS.

| | | | |
|------------------------------------|---|----------------------------------|----|
| Amputation of thigh, | 4 | Excision of olecranon, | 1 |
| arm, | 2 | testicle, | 1 |
| leg, | 4 | fungus of testicle, | 1 |
| great toe, | 2 | tumour, | 11 |
| thumb, | 1 | tonsils, | 3 |
| finger, | 6 | cancerous sores, | 5 |
| Excision of elbow-joint, | 5 | warty excrescences, | 4 |
| knee-joint, | 2 | Lithotomy, | 4 |
| upper jaw bone, | 1 | Strangulated hernia, | 1 |
| mamma, | 4 | Aneurism, | 2 |

| | | | |
|----------------------------------|---|---------------------------------|----|
| Cataract, | 1 | Hemorrhoids, | 6 |
| Fistula lachrymalis, | 1 | Polypus nasi, | 3 |
| Pterygium, | 1 | — auris, | 1 |
| Hydrocele, | 5 | Exfoliations removed, | 6 |
| Hæmatocele, | 2 | | — |
| Fistula in ano, | 4 | | 95 |
| Recto-vaginal fistula, | 1 | | |

To complete this Report, I may mention the expence that has been incurred in instituting and conducting the establishment, which consists of one house-surgeon, a steward, house-keeper, cook, house-maid, two nurses, and twenty-four patients. My senior apprentices write the patients' cases, the juniors dress them, and the care of the out-patients is distributed over the whole, according to their progress, activity, and intelligence.

The following is an abstract of the treasurer's account :—

Abstract of Hospital Account from May 1829 to May 1830.

| | | | |
|---|-------|----|----|
| By subscriptions and donations from the public, | L 217 | 14 | 0 |
| — payments from Mr Syme, | 779 | 7 | 0 |
| — interest from bankers, | 1 | 3 | 10 |
| | L.998 | 4 | 10 |

| | | | |
|---|-------|----|----|
| To paid fitting up, including advertising and sundries, | L.362 | 15 | 7 |
| — rent, | 100 | 0 | 0 |
| — weekly expenditure, | 393 | 19 | 9½ |
| — taxes and water duty, | 15 | 3 | 4 |
| — servants' wages, | 64 | 10 | 0 |
| — medicines, | 61 | 16 | 1½ |
| | L.998 | 4 | 10 |

In conclusion, I have to regret my inability to express in adequate terms the deep and grateful sense which I feel of the kind and judicious advice of my respected colleague, Dr Ballingall, my obligations to whom, if stated particularly, would have greatly extended the length of these Reports.

ART. II.—*On the Diagnosis of the Diseases of the Lungs and Pleura.* By J. C. GREGORY, M. D., F. R. S. E.; One of the Physicians to the Royal Infirmary.

PATHOLOGISTS and medical writers in all ages have felt, and many of them have acknowledged the difficulty of establishing an accurate diagnosis in the various diseases of the lungs and pleura; "O quantum difficile est curare morbos pulmonum! O quanto difficilius eosdem cognoscere; et de iis certum dare præsagium! Fallunt vel peritissimos, ac ipsos medicinæ principes," are the words of Baglivi; and the older authors, aware of the frequency and importance of these affections, endeavour-

ed to find in the general symptoms, and the disorder of the functions accompanying them, some certain and constant, and, if possible, physical signs, by which they might be recognized and distinguished from one another with more precision. That their endeavours to accomplish this laudable object were not attended with much success, the vague, imperfect, and often confused description of the diseases of the chest to be found in their works bears ample testimony.

Even the cultivation of pathological anatomy, which has formed so important an epoch in the history of medicine, and contributed so much to extend our knowledge of the nature and seat of diseases, notwithstanding the remarkable impulse it communicated to every department of pathology, did not enable the pathologists of the last century altogether to dispel the obscurity and uncertainty which still involved the diagnosis of many of the diseases of the chest. Accordingly, we find the accurate Morgagni expressing himself thus cautiously, in commencing his book *De Morbis Thoracis*:—"Etsi multo pauciores in thorace, quam in capite, sunt partes, neque in iis ulla, cujus fabrica et fabricæ munera cæcis sint tenebris involuta, sicut est cerebrum; tamen inter paucas hasce partes tanta est sive ob vicinitatem, sive ob nexum, sive ob officia conjunctio, ut una læsa, plerumque cæteræ lædantur. Quæ res mihi a morbis capitis ad thoracis morbos transeunti magnam afferret, eamque haud raro insuperabilem difficultatem, cum in morbo principe a conjunctis reliquis separando, tam in ejus prima sede ac præcipua definienda, nisi ad te scriberem, qui ut sæpe in aliis, ita in hac re quoque *nihil a me nisi probabilem conjecturam requires*." And Dr Cullen in his *First Lines* states, that under the title of *Pneumonia*, he means "to comprehend the whole of the inflammations affecting either the viscera of the thorax, or the membrane lining the interior surface of that cavity; for neither do our diagnostics serve to ascertain exactly the seat of the disease, nor does the difference in the seat of the disease exhibit any considerable variation in the state of the symptoms."*

The degree of difficulty and uncertainty that has hitherto enveloped this subject, may be ascribed to various causes. Of

* Subsequent investigations, it is scarcely necessary here to observe, have shown satisfactorily the inaccuracy of the statements made by Dr Cullen in this passage. Our diagnostics, as, I trust, will appear by the sequel, do enable us to ascertain, with sufficient precision, the seat of the disease both in pleurisy and peripneumony; and the symptoms of these two diseases, when uncombined, are widely different. We can no longer, therefore, even in the common language of practice, confound under the general denomination of pneumonia the description of two diseases so distinct in their characters as inflammation of the lungs and inflammation of the pleura.

these the principal, in addition to that pointed out by Morgagni, appear to have been,

1st, The similarity of the general symptoms in many of the diseases of the chest, and the absence of any strictly pathognomonic signs, well-marked, and liable to little variation, by which they might be readily and certainly distinguished from one another, as in the case of some of the organic diseases of the brain.

2d, The unyielding nature of the parietes of the thorax, which of course precludes any manual examination of the parts contained,—a source of so much direct and valuable information in the diagnosis of the diseases of the abdominal viscera.

3d, The want of proportion frequently found to exist between the degree of intensity of certain of the symptoms, and the amount of morbid action and organic change of structure, with which they are connected.

4th, The want of some means of investigation, by which the seat of the diseased action, and the nature of the various changes to which it gives rise within the chest, might be ascertained with greater precision during life.

The three first mentioned causes of difficulty and uncertainty are inherent in the nature of the subject under consideration, and perhaps irremediable; but the last, implying a deficiency in our means of investigation, points out an important desideratum, which appears to me to have been supplied, at least to a certain degree, by the introduction of auscultation and percussion of the thorax.

I do not come forward as the panegyrist of these new modes of investigation, or of the distinguished pathologists to whom we are indebted for their introduction. That is a subject which has now, I believe, been fully exhausted; and I may be permitted to observe, that the well-meant but injudicious zeal which some of Laennec's disciples in this country have displayed in impressing upon the profession at large, their own conviction of the immense advantages that must result from the use of auscultation, and the disposition they have shown to enhance the merit of his discovery by exaggerating its practical importance, while at the same time they have enlarged upon the difficulty of acquiring a competent knowledge of its details, have perhaps done more to retard the general adoption of this method of investigation in diseases of the chest, than any opposition it has yet encountered, whether from hostility, ridicule, or from a still more powerful enemy, the abstract dislike and distrust of all innovation, which pervades so large and so respectable a portion of the medical public. But ten years have elapsed since the *Traité de l'Auscultation Médiate* was first given to the world,

and it has now stood the test of time, that grand ordeal of all discoveries. We are therefore called upon, as it appears to me, henceforth to judge the discovery of Laennec, (if it can be strictly called a discovery of modern date,) solely by its own intrinsic merits; unbiassed alike by the natural and very pardonable enthusiasm of an author on the subject of his own favourite pursuit on the one hand, and by the too common prejudices against innovation on the other. Sufficient time appears now to have elapsed to enable us to form a correct and impartial estimate of its claims to the respect and attention of every candid and enlightened physician.

There are now few public hospitals in this country in which auscultation and percussion are not more or less employed; and I believe I may say, that there are very few among the intelligent students frequenting our hospitals who do not seek to make themselves acquainted with the principal indications which they afford. In due course of time, therefore, it is highly probable that the practice will be as widely diffused as its warmest friends could desire. But in the meantime, I believe, there are comparatively few among the great body of practitioners throughout the country who employ auscultation and percussion, at least to any considerable extent;—deterred probably partly by their supposed difficulty, and partly by uncertainty as to the degree of credit and importance to be attached to their indications. Under this impression, it has occurred to me that a plain and succinct statement founded on some experience, and divested as much as possible of partiality or exaggeration, of the true grounds upon which their claims to our attention must ultimately rest, and of the real amount of advantage which we can reasonably expect them to afford, might perhaps have the effect of removing some of the erroneous impressions that prevail generally on the subject of these methods of investigation.

In the remarks I am induced to offer with this view, I have no new facts or opinions to advance on the subject of auscultation. I beg, therefore, to be understood as addressing myself solely to those practitioners who have acquired as yet little or no practical knowledge of its details; and, as my object is to facilitate the study, not to enhance the merits of this mode of investigation, I think it more prudent to run the chance of dissatisfying some of its most strenuous advocates, by estimating its importance, as they may perhaps think, at too low a rate, than ultimately to injure the cause I wish to serve, by even the semblance of any undue partiality or exaggeration. Should I, even unintentionally, in any respect undervalue its real merits, the injustice or omissions I might be guilty of, would, I have no doubt, be speedily discovered and pointed out by some of

those who have been, or may be hereafter induced to turn their attention to the subject of auscultation, were it only to show their own proficiency in the study of its indications. But were I in any respect to overrate its importance or utility, this would be still more speedily discovered, and would inevitably and justly attach a degree of suspicion and discredit to every statement I could advance in its favour.

Any detailed account of the various physical signs furnished by auscultation and percussion, would be incompatible with the limits within which I propose to confine myself. I must therefore refer those who may desire full information on this subject, and who may not have access to the "*Traité de l'Auscultation Médiate*," in the original language, to the excellent translation of that work by Dr Forbes ;—to the short abstract contained in the "*Original Cases*" published by the same gentleman ;—to the "*Introduction to the Use of the Stethoscope*," published by Dr Stokes in 1825 ;—and to the later work of Dr Williams, entitled, "*A Rational Exposition of the Physical Signs of the Diseases of the Lungs and Pleura*." A succinct description of them also, in relation to the individual diseases of the chest, has been given elsewhere by the late Dr Cullen and myself.*

Nor do I propose to support my statements by a dull and tedious detail of cases, in which the diagnosis established by aid of auscultation and percussion during life was established by examination after death. It appears to me that a sufficient number of illustrative cases has been already published, and that evidence of this kind is no longer necessary to prove the general truth and accuracy of the physical signs which they furnish. I am not aware, at least, that any one who has qualified himself by a little attention to form a judgment on this point, has ever seriously called in question the greater degree of certainty and precision of diagnosis we are enabled to attain in many cases by their combined assistance. The question, therefore, as to the general adoption of auscultation and percussion in the investigation of diseases of the chest, must now be decided, I conceive, by the amount of *practical advantage* that can be shown to result from the minute and accurate information which they undoubtedly afford. "Any objection," as Dr Forbes has well observed, "that can be made against the adoption of these in practice, must apply to the *utility* of the minute diagnosis obtained by them, and not to their specific fitness to supply it." Should there, however, remain any who are scepti-

* Cullen's "*First Lines of the Practice of Physic*." A New Edition ; with an Appendix by the late Dr W. Cullen and Dr J. C. Gregory. Edinburgh, 1829.

cal as to the truth and accuracy of these physical signs, I would beg leave to refer them for ample and unimpeachable evidence on this point to the valuable works of Laennec, Andral, Louis, and Piorry of Paris; and those who may prefer the testimony of physicians who have paid attention to the subjects in this country, I would refer particularly to the "Original Cases" of Dr Forbes;—to the paper upon empyema and pneumothorax in the Edinburgh Medical and Surgical Journal for October 1827, by Dr Duncan, to whom the profession is, I believe, indebted for the first introduction of auscultation and percussion in this country;—to the "Selection of Cases," and "Additional Cases," by Dr Graves and Dr Stokes, in the 4th volume of the Dublin Hospital Reports;—to the "Inquiry into the Value of Mediate Auscultation," by Dr Stack, in the same volume;—to the "Clinical Observations on Phthisis Pulmonalis," by Dr Stokes, and the "Cases intended to illustrate the application and utility of the Stethoscope," with an "Appendix," by Dr Townsend, in the 5th volume of the Transactions of the College of Physicians in Ireland.*

But the publication of selected, and perhaps rare cases, however interesting in themselves, and however well calculated to prove the accuracy of the physical signs furnished by auscultation and percussion, will not, I apprehend, be generally held conclusive evidence as to their practical importance and utility, the grand test by which they must ultimately be judged. For this purpose evidence of another kind will be required by many at least, among the practitioners of the present day in this country. They must have the candid and unbiassed testimony of physicians, whose ample opportunities of observation, attentive study, and long experience of these methods of investigation, have fully qualified them to determine the following questions: 1st, Whether the additional insight given by these means into the nature and seat of the various affections of the chest, has tended in any respect to modify the commonly received notions in regard to their *pathology*? 2dly, Whether the greater precision of diagnosis thus obtained is in reality of importance as influencing the *prognosis* in these diseases? And, 3dly, Whether the practice has led, or is likely hereafter to lead, to any material alteration or improvement in their *treatment*?

These are essential points to be kept in view in estimating the value of these methods of investigation, and their claims to

* I may also refer to a forthcoming work on Auscultation by Mr Spittal, lately physician's clerk in the Royal Infirmary, which will contain a considerable number of illustrative cases that have come under his own observation.

general attention and adoption. And, although the time that has yet elapsed may not be sufficient to permit of a satisfactory solution of them all, I shall endeavour to point out those circumstances in the evidence thus obtained which appear to me to bear most directly upon these questions. *

I propose in the first place, however, to take some notice of the principal objections which have been brought against the practice of auscultation. I shall then make some general remarks upon the nature and character of the evidence afforded by auscultation and percussion, and on the degree of reliance that can reasonably be placed on their indications: And lastly, I shall conclude by pointing out very shortly the amount of diagnostic information which they furnish in the most important diseases of the lungs and pleura.

The principal objections which have been hitherto urged against the practice of auscultation, and the only ones which appear to me worthy of notice here, are,

1st, That it is a modern discovery, which does not come to us recommended by the sanction and authority of past ages; and, therefore, that it ought to be received with great caution and reserve.

2d, That, granting generally the accuracy and importance of its indications, the difficulty of acquiring a competent knowledge of these in reference to particular diseases is so great, and there are so few who can bestow the necessary time and labour upon the acquisition of that knowledge, that the practice can never become general; and, therefore, that it must be restricted virtually to those who, along with an extensive field of observation and study in health as well as in disease, enjoy the advantage of organs acutely sensible to nice distinctions of sound.

3d, That the practice must be confined in a great measure to hospitals, as its introduction into the higher ranks of life would be very difficult, and in many cases impracticable.

4th, That, supposing these difficulties and objections to be overcome, auscultation does not inform us of the existence of diseased action within the chest sooner than, or perhaps so soon as we are enabled to infer its existence by other and more ordinary means.

* As it may very naturally be asked why I consider myself entitled to give an opinion on this subject, it may be proper to mention here, that for the last six years my attention has been particularly directed to auscultation and percussion, and that during two years of that period I enjoyed the advantage of studying their indications under the immediate tuition of the amiable and lamented Laennec.

5th, And lastly, that all the information thus obtained, does not lead to any practical result different from that to which the investigation of the ordinary symptoms alone would lead.

In answer to the charge of novelty, the following passage from the Section of the *Treatise de Morbis* entitled "*Hydrops Pulmonis*,"—" *Et si multo tempore aure ad latera adhibita audire tentaveris, ebullit intrinsecus velut acetum*,"—may be quoted, as showing that the fact of the transmission of sounds audible on the application of the ear, through the parietes of the chest, the fundamental principle on which auscultation rests, was known even to Hippocrates. And if so accurate an observer did not duly appreciate the importance of this fact, or did not foresee its extensive application in pathology,—if it was forgotten or neglected for so many centuries—this might perhaps furnish us with additional proof, if such were required, of the scanty knowledge possessed by Hippocrates and his successors, in regard to the real nature of the various physical changes induced by morbid action within the chest; but cannot be brought forward with any fairness, I conceive, as an argument against the practice of auscultation in the present day, when the deeper insight into the nature and effects of disease, acquired by the more extended and accurate cultivation of pathological anatomy, has clearly pointed out the importance of any physical signs by which these changes may be detected during life. Nor ought we to be surprised that it was reserved for modern industry and sagacity to discover the importance of this principle, and prosecute the wide field of pathological investigation thus unexpectedly disclosed, when we consider that the varied general acquirements which Laennec possessed in such an eminent degree, as well as his minute and extensive acquaintance with pathological anatomy, scarcely enabled him to explain satisfactorily all the phenomena of auscultation.

In medicine, innovations of any kind, especially if they come in the questionable shape of improvements, immediately and naturally excite suspicion; and in adopting them it is not only praiseworthy but absolutely indispensable to exercise due caution and reserve. I may be permitted, however, to remark, in regard to auscultation, that, as the principle on which it rests appears to have been known in the earliest period of the history of medicine, and as its modern application in pathology has been before the public for so many years, we can scarcely look upon it now in the light of an innovation.

It may be stated, moreover, that if there be any weight in this objection to auscultation, it ought to apply with equal force to percussion. This mode of investigation was discovered by

Avenbrugger in the middle of the last century, but it was neglected or forgotten, till Corvisart, with his usual sagacity, saw its importance, and rescued it from oblivion. Yet its value, within certain limits at least, is now generally acknowledged, I believe, even by many of those who still remain sceptical on the subject of auscultation.

In regard to the second objection,—the difficulty of acquiring a competent knowledge of its details,—I am quite satisfied, from what I have myself witnessed, that this has been much exaggerated. It is no doubt true that there are certain indications of peculiar character and of comparatively rare occurrence, which it requires time, opportunities, and perhaps a naturally delicate ear, to be able at all times to detect and distinguish. But these signs are few in number, and from the very fact of their rare occurrence, they are in reality of minor importance; and I have long been convinced, that an adequate knowledge of the more ordinary signs, as they occur in those diseases of the chest which are daily brought under our observation, may be acquired in a short time and by a little attention, even without the advantages of a very extensive field of study, or any peculiar nicety of ear. So that, if the importance of auscultation be admitted generally, I have no hesitation in affirming, that the advantages it affords are not necessarily restricted to a few physicians placed in very favourable circumstances; but, on the contrary, that it is in the power of every one who enjoys ordinary opportunities, and possesses even a moderate portion of zeal, to make himself fully acquainted with its details, and to avail himself of all the information he can thus obtain. As to those few signs which occur more rarely, and require for their detection greater care, and perhaps a nicer discrimination, they are yet so peculiar and characteristic, that when once heard, they are not likely to be afterwards either forgotten or mistaken.

In regard to the third objection, that it would be very difficult, and in many cases impracticable, to introduce auscultation into the higher classes of society, I have only to observe, that this can be understood to apply solely to the female portion of the higher ranks; as I presume, (supposing always that its importance has been admitted) that no reasonable objection could be made to it on the part of any male patient. And even in the case of females, when we see how readily they submit to minute and often painful examination by the hand, in diseases of the abdominal and pelvic viscera, merely with a view in many cases, let it be observed, to a more accurate knowledge and diagnosis of the disease, we need not, I think, be under any appre-

hensions that their natural feelings of delicacy would seriously interfere with an examination of the chest, where it is unnecessary to uncover, or even to apply the hand to any part of the person.

In regard to the fourth objection, that auscultation does not inform us of the presence of diseased action within the chest sooner than, or perhaps so soon, as we are enabled to infer its existence by the methods of investigation in more ordinary use, I may remark, that the truth of the position here laid down might very fairly be called in question in the case of several of the diseases of the lungs and pleura, and, I have no doubt, would be stoutly denied in regard to all of them by some of the most strenuous advocates for this practice. I have no wish, however, to enter upon disputed ground, nor do I come forward to arrogate in favour of auscultation any superiority in this respect over the usual methods of investigation. But, aware how frequently we are deceived, and how far we are sometimes misled in our inferences and conjectures, by relying too implicitly upon the ordinary symptoms of these diseases, I wish to draw the attention of physicians more pointedly to the greater degree of certainty I conceive we are enabled to arrive at in their investigation, by means of the physical signs furnished by auscultation. My object is to show, not that by this mode of investigation we can infer the existence of the diseases of the lungs and pleura sooner; but that by means of the ordinary symptoms and the physical signs conjointly, we are enabled to recognize and distinguish them better; and to ascertain with greater precision the various forms which they assume, the stages through which they pass, and the physical changes which they induce.

To the last, and probably in the eyes of many the most important of the objections urged against auscultation, that all the information it conveys leads to no practical result,—no method of treatment different from that which the investigation of the ordinary symptoms alone would indicate, I might answer in the words of Sydenham:—"Non minus certo etiam a minutissimis morbis circumstantiis Indicationes Curativas possit medicus desumere, quam ab iisdem sumsit Diagnostica."* Or I might refer to the following passage from Baglivi, who expresses himself still more strongly on this point:—"Prima basis curandorum morborum, est recta eorundem cognitio, atque debitum unius ab alio discrimen; latent enim velut in alta nocte prima morborum stamina, nec arte magistra in curationem eorundem pervenimus, nisi faciem præferat solida diagnosis. Calculum vesicæ cognoscere ac præagere nonne gloriosum est, nonne ad medici famam et utilitatem commodissimum est? Ita pariter alios quoslibet dignoscere ac præagere morbos, penè divinum dixerim."†

* *Observ. Med. Præfatio.*

† *Prax. Med. Lib. ii. Cap. viii. Sect. i.*

But I have reason to believe that there are still some physicians who may be inclined to dispute the principles here laid down, and to question generally the importance of very minute and accurate diagnoses in the treatment of diseases of the chest. And if, notwithstanding the testimony of practical observers of such eminence and authority as Sydenham and Baglivi, a difference of opinion upon this essential point is still found to exist, it is scarcely to be expected that the practical importance and utility of the *means* by which this greater precision may be acquired, will be generally or fully acknowledged in the present day without controversy. This, however, is a subject which would open up a wider field for discussion than I propose to enter upon. I shall therefore content myself with quoting from the modest Morgagni the following words; they are employed by him in the vindication of morbid anatomy from a similar reproach, but they appear to me singularly applicable to a mode of investigation, which, whatever its other merits or defects may be, has at least this one advantage, that the information it conveys is always obtained during the life of the patient:—"Quod si nihil utile ad sanandum cadaverum sectiones docerent, quæ complura ad id necessaria docent, et solum, qui morbi insanabiles sint, patefacerent; non levem tamen, præter veræ diagnosis, et prædictionis honorem, afferrent utilitatem, ne ægros videlicet tot supervacuis et fortasse noxiis remediis fatigantes, eorum obitum acceleraremus, sed contra, levaremus symptomata palliativâ ut vocant curatione, morbique incrementum, quo ad liceret, tardaremus, nec temere pronunciantes committeremus, ut cadaveris incisio errorem detegeret nostrum." *

Every candid physician who has been, or may be hereafter, induced to turn his attention to the subject of auscultation, and to acquire a competent knowledge of its details, will naturally form his own judgment of its practical utility in the treatment of diseases of the lungs and pleura, by the degree of importance which his own experience in such cases may have led him to attach to more precise and accurate information in regard to the nature, the seat, the extent, the progress, and the effects of diseased action within the chest, than the investigation of the ordinary symptoms alone can afford. And even should he find that this additional insight, when acquired, does not immediately lead to any corresponding improvement or success in the treatment of these diseases, he may still say with Morgagni, "Non levem tamen, præter veræ diagnosis et prædictionis honorem, afferret utilitatem," if it assists or directs him in his endeavours to palliate those symptoms which he cannot cure; if it saves him

* De Sed. et Caus. Morb. Tom. ii. Præm.

from harassing a patient with remedies which are at least unavailing, if they are not hurtful; and if it even spares him the pain and mortification of having misunderstood the nature of the disease.

I now proceed, according to the plan I laid down, to make a few general remarks on the nature and character of the evidence furnished by auscultation and percussion, and on the degree of reliance that may reasonably be placed upon evidence of this kind in the investigation of diseases of the lungs and pleura.

Auscultation may be defined in general to be the application of the sense of hearing to ascertain the healthy or morbid condition of the parts contained within the chest. The principle on which it is founded is simply this, that the passage of the air through the lungs during the natural actions of respiration or speaking, gives rise to certain sounds or phenomena, which are communicated through the parietes of the thorax, and are audible on the application of the ear. As these phenomena take place during the movements communicated to the parts contained within the chest, and as they are generally referable to the known mechanical laws of acoustics, they are considered to indicate, with more or less certainty, the physical condition of these parts in the state of disease, and have therefore been called physical signs, to distinguish them from the more variable and equivocal symptoms of the lesions of these organs, drawn from disordered functions, uneasy sensations, or changes of sensible qualities.

The physical signs, or the sounds which are audible in the natural and healthy state, are few in number, and they vary somewhat in different parts of the chest, and in different persons. But they possess certain definite characters, and furnish a sufficiently accurate standard of comparison with the more numerous and more striking phenomena which very frequently either modify or replace them, and indicate with more or less accuracy the presence of disease. The signs of the first class consist of certain simple sensations *sui generis*, and scarcely admit of comparison with sounds produced in any other way; those of the second, on the other hand, generally bear some resemblance to other known sounds to which they may be referred. But the *presence* of disease is not the only fact disclosed by these physical signs. By the different characters which they present we are enabled to form a judgment of the precise nature and seat of the morbid action; by the extent of surface on one or both sides of the chest over which they are audible, we are enabled to measure pretty accurately the extent, and consequently in many cases the severity and danger of the disease;

and by the changes which they undergo, we are enabled to examine, and generally to ascertain with some degree of certainty, its progress and its effects.

It is scarcely necessary to advert here to the information we derive from this source, in a class of affections, not the less important and dangerous that they are latent and obscure, in which the most characteristic ordinary and functional symptoms of disease within the chest, as we see in many cases of chronic pleurisy or pneumonia, and in the course of some continued fevers, have either never existed, or have in a great measure disappeared; and in which the symptoms that do exist are either insufficient to detect the presence of such disease, or are very apt to deceive and mislead us in regard to the nature, the seat, and the degree of intensity of the morbid action.

Nor is the negative evidence of auscultation less generally important than the more positive information obtained by these physical signs. The absence of the natural and healthy sound over a considerable portion of one or both sides of the chest carries with it a strong presumption at least of the existence of disease to a greater or less extent; while, on the other hand, the absence of all the signs which usually indicate the presence of morbid action, affords good, though not absolutely decisive evidence, that the lungs and pleura are free from disease.

By thus enabling us to bring the local phenomena, the physical characters, and the effects of morbid action within the chest, so far under the immediate observation of a sense previously almost wholly unavailable for such a purpose, auscultation may be said to have disclosed a new and very direct source of pathological investigation in a class of diseases, the diagnoses of which have hitherto been involved in much obscurity and uncertainty; and in which any means of acquiring, during life, additional information on these essential points ought to be the more important, as that obtained by the other senses is, and must always be, so scanty and unsatisfactory.

But although it affords indications which fall immediately under the observation of the senses, and therefore partake more or less of the direct and positive character of physical evidence, yet auscultation, taken alone and apart from other sources of information, cannot be considered as either a sufficient, or by any means an infallible guide in the investigation of the diseases of the chest. There are many cases in which, were we to rely solely upon its indications, to the exclusion of the evidence derived from the concomitant symptoms and from percussion, we should expose ourselves to commit very gross and serious errors in regard both to diagnosis and prognosis. “Adeo in medi-

cina facile est par ea ipsa interdum decipi, quæ facere videntur ad vitandas deceptiones." *

Hence arises the expediency, and on many occasions the necessity, of carefully weighing the evidence afforded by the ordinary and functional symptoms, along with that of auscultation and percussion, before hazarding any decided opinion as to the diagnosis in doubtful cases of morbid action within the chest; and the propriety of due caution in drawing from the physical signs alone, conclusions which may tend materially to affect the treatment of diseases. This I cannot illustrate better or more forcibly than by quoting the following judicious observations of Dr Forbes:—"The reason of this caution will be obvious, on considering the relative characters of the physical, and the common or sympathetic diagnostics. In general, we depend so little on any *one* symptom of a disease, that we seldom risk any momentous treatment, or hazard a decided prognosis on it; and, therefore, it is not a matter of very great consequence, practically, whether we are right or wrong respecting its supposed import in any individual case. It is very different, however, with many of the indications furnished by mediate auscultation or percussion. To such persons as admit their authority, these carry with them the conviction of almost physical demonstration; and it is impossible not to yield to opinions founded on such a basis, assent of a very different kind from that which follows the contemplation of a mere sympathetic symptom. We may deem lightly of a quick pulse, or a hurried respiration, or an acute pain, because we know that all these may accompany an affection of the most temporary kind, and of no danger; but when we know that the fleshy sound, or absence of respiration over one side of the chest, can only arise from a great organic change, it is impossible that we can regard such a sign but as one of the highest consequence, and as worthy to determine our prognosis, and direct our practice. I would therefore advise the young auscultator not to act upon his earlier explorations, unless the practical indications furnished by them accord with those which are supplied by the

* Morgagni, De Sed. et Caus. Morb. Epist. xx. Art. 31.

It may perhaps entitle the opinion I have here expressed to some consideration to state, that I find it to coincide entirely with that entertained by so distinguished a pathologist, and so competent a judge as M. Andral, who makes the following just and apposite remark on this subject:—"Je viens de rappeler quelques-uns des cas nombreux dans lesquels l'auscultation a singulièrement contribué à élever le diagnostic médical à une précision véritablement mathématique. Cependant, il ne faut demander à cette méthode que ce qu'elle peut donner, et il est aussi beaucoup de cas où, en accordant une trop exclusive confiance aux renseignements qu'elle fournit, en ne voulant reconnaître de lésions, dans le poumon ou dans les cœur, que celles qu'elle y découvre, on arriverait aux plus singuliers mécomptes." Dictionnaire de Médecine et de Chirurgie Pratiques, Tom. iii. Article *Auscultation*.

common symptoms. A little learning may, in this case, be truly a dangerous thing. I am even disposed to recommend some degree of the same caution to the most experienced ; since I think it may be laid down as an axiom, that in proportion as we consider our diagnostics certain, ought we to be cautious not to misapply or misconceive them." *

I have hitherto made no mention of the instrument commonly employed to convey to the ear the various phenomena of auscultation. This omission has been intentional on my part ; and my object in so doing, was to show that the stethoscope, although an useful auxiliary in the practice of this method of investigation, is by no means essential, either to the principle on which it is founded, or to its general application. In fact all, or almost all, the signs furnished by auscultation, may be heard by the immediate application of the ear to the parietes of the chest ; and in this way two objections to the practice, which might have some weight, are removed,—namely, the trouble of learning the proper use and application of the stethoscope, which is erroneously supposed to be difficult, and that of carrying habitually about the person an instrument of this size. But these inconsiderable advantages are more than counterbalanced by several inconveniences and disadvantages necessarily attending this mode of auscultation, which must effectually prevent the immediate application of the ear from ever being generally employed in preference to the stethoscope. Independently of the very obvious objections on the score of delicacy in females, and of cleanliness in the case of many of both sexes, (circumstances in themselves sufficient to prevent that habitual application of the ear to the thorax, by which alone the requisite skill and confidence in this practice can be acquired,) there are certain parts of the chest, such as the upper part of the axilla, the angle formed by the clavicle and the head of the humerus, and the acromial region, especially in emaciated subjects, where important signs frequently exist, and where the immediate application of the ear is nearly, if not altogether, impossible. And even in those points where it is practicable, the sounds communicated through the extent of surface necessarily applied, and those caused by the friction of the hair, the ear, and parts of the head and face of the observer, upon the clothes or skin of the patient, either obscure and overpower, or materially interfere with the sounds proceeding from that point of the chest directly beneath the external meatus, the state of which it is his object to ascertain ; while the constrained and stooping posture, which he is fre-

* Original Cases, &c. Preface, p. 23.

quently obliged to assume, has the natural effect of rendering the sense of hearing obtuse. The peculiar and distinctive character, moreover, of one or two of the more important signs appears to depend in some measure upon the transmission of the sound through the narrow tube of the stethoscope; and this is either lost, or much changed, when they are heard by the naked ear. The habit, it may also be remarked, of applying the stethoscope perpendicularly, and of retaining its extremity in close apposition with the chest during the movements of the parietes, so that no extraneous sounds are communicated through it; and that of applying the ear, so that the external meatus is at once brought exactly opposite the tube of the cylinder, are acquired in a very short time; and, like other minute circumstances connected with the use of the instrument, more effectually by the practical experience of a few days, than by any written detail of the precautions to be observed.

With the exception of the ivory or horn ear-piece, an addition approved of by Laennec himself, which, by enlarging the diameter of the top of the cylinder, allows of a readier and closer adaptation of the ear, and, consequently, more completely excludes all extraneous sounds, I am not aware that any very material improvement has been made in the construction of this instrument since it was first invented. Cedar, as a wood of moderate density, and a good conducting medium, is well suited for the purpose; and that form of stethoscope delineated by Dr Williams, in his work already mentioned, is perhaps the best, as being at the same time simple, and constructed with some attention to the scientific principles of acoustics. That recommended by M. Piorry is of smaller dimensions, and lighter; but I have not found that it possesses any other advantages; and it certainly has the disadvantage of being more easily injured and broken than those in common use. On this subject, I think it may be laid down as a general proposition, that, in the practice of auscultation, much more depends upon the patient and attentive, perhaps the naturally discriminative, ear of the observer, than upon the form of the instrument he employs.

In regard to percussion, I may observe, that limited to indicating with more or less certainty the presence or absence, the increase or diminution of the natural resonance of the chest, the evidence it furnishes would only be applicable when taken alone to the case of a few organic lesions and alterations, and these chiefly in their more advanced stages; its indications would be generally vague, equivocal, and liable to much fallacy. But it acquires great additional certainty and precision, by being combined with auscultation, and there are several important af-

fections, the accurate diagnoses of which are only established by comparing the evidence furnished by both these methods of investigation. The more precise and minute indications of the one, tend to confirm or correct the more general and more uncertain indications of the other; and in this view, percussion, of which auscultation may be called the necessary as well as the natural complement, is a very valuable, if not an indispensable auxiliary in the investigation of the physical signs of thoracic disease. *

I now come, as I proposed, in the last place, to consider the practical application of auscultation and percussion to the diagnosis of the individual diseases of the chest. It is not my object, nor would my limits permit me, to enter minutely or at any length upon this part of the subject. I must therefore refer those who may desire full details to the works I have already mentioned. But with a view to placing their claims to general attention on a better footing, by restricting within its true and proper limits the amount of advantage which we can reasonably expect to result from their use, I shall point out very shortly what appears to me to be the most important, and the least equivocal diagnostic information we derive from the physical signs in the investigation of the principal diseases of the lungs and pleura. These I shall take as nearly as possible in the order of their frequency.

Catarrh or Bronchitis.—The *sibilant*, *sonorous*, and *mucous râles* with their varieties, as described by Laennec, and as they accompany the different forms and stages of this disease, may be classed under the general title of *catarrhal râles*.† The two first of these physical signs are caused by the forcible passage of the air, during respiration, through bronchial ramifications unequally contracted in some part of their course by the partial inflammation and tumefaction of the mucous membrane. When this constriction of the air tubes takes place in some of the larger branches of the bronchiæ, the sounds heard are deeper and graver than when it occurs in ramifications of smaller diameter,

* Percussion has been lately improved and considerably extended in its application by M. Piorry, Professeur agrégé at the School of Medicine in Paris, who employs a small thin plate of ivory placed on the part to be examined. By this simple expedient, and the common horn ear-piece of the stethoscope answers the purpose perhaps equally well, a clearer sound is elicited in many cases, and with greater ease both to the patient and the operator. If there be any who still distrust the indications furnished within certain limits by percussion, I would beg to refer them to the experiments on the dead body, as well as the observations on the living, contained in the work of M. Piorry, "Sur la Percussion Médiante." To several of the experiments there detailed, I was myself an eye-witness, and can bear testimony to the accuracy and precision of the results.

† This word is sufficiently expressive; and as there is no equivalent term in the English language, the French term has been generally received and adopted in preference to the less expressive Latin word *Rhonchus*.

where they are necessarily more acute. The tone and intensity of these kinds of catarrhal râle, vary according to the situation and degree of the morbid action existing in the bronchiæ, and they are generally observed more or less combined. As they are commonly audible from the very commencement of the disease, even before any cough or secretion from the mucous membrane has taken place, they may be considered as characteristic of the earlier stages of acute catarrh. As the disease advances, and as it assumes the chronic form, they either give place to, or are combined with the mucous râle,—a sound evidently caused by the passage of the air through the fluid mucus then secreted and accumulated in the bronchiæ. This sign also varies in intensity according to the quantity and consistence of the mucous secretion, and the size of the bronchiæ in which it takes place. In the smallest ramifications it passes by insensible gradations into the minute crepitating râle to be afterwards mentioned, and in the large branches it approaches to the cavernous râle of a tubercular excavation. The rattle in the throat of the moribund, audible at a considerable distance, and familiar to all, is merely the extreme degree of the mucous râle taking place in the larynx and trachea. This râle may be considered as the characteristic physical sign of the later stages of the acute, or of the chronic form of catarrh.

In all cases of simple catarrh, where the mucous membrane is alone affected, the natural resonance of the chest on percussion remains unchanged, while the respiratory murmur, where it is not obscured by these rales, is commonly diminished in intensity, and is occasionally completely suspended for a time over a portion of the chest.

I am not aware that these catarrhal rales, as they commonly occur, are liable to any material fallacy; and therefore, I think we are justified in affirming that they afford signs by which we may ascertain more readily and accurately than hitherto the seat, the extent, and the progress of pulmonary catarrh.

The physical signs of idiopathic bronchitis are equally applicable to the catarrhal affections which accompany, and often constitute a great part of the danger in measles, small-pox, hooping-cough, croup, and asthma; as well as of those which so frequently occur in the course of continued fever, and many chronic diseases; and the information thus obtained is the more important, as it may be laid down as a general principle, that the severity and danger of catarrh, whether idiopathic or symptomatic, is proportioned to the extent of one or both lungs affected. It may also be mentioned, that in such dangerous affections as cynanche laryngea or trachealis, and œdema glot-

tidis, where impending suffocation sometimes renders the operation of tracheotomy advisable, the presence or absence of these catarrhal râles over the chest is a circumstance of peculiar importance; because in many of these cases the inflammatory action and its consequences are not confined to the larynx and trachea, but extend downwards into the bronchiæ, even to their minute ramifications; and the expediency of performing the operation, as well as its chances of success, must depend materially upon the healthy or morbid condition of the air passages below the part principally affected, which cannot, in these diseases, be ascertained with so much precision by any other means.*

No reasonable doubt can be entertained, that in these last mentioned cases at least, the additional information afforded by auscultation bears directly upon an important practical point in their treatment. And if, as I have shortly endeavoured to show, this method of investigation leads to greater precision of diagnosis, and furnishes more accurate knowledge of the extent and progress of pulmonary catarrh, I should think that its influence on the prognosis in this disease can scarcely be called in question.

But although we derive information from the *presence* of these catarrhal râles, which we may rely upon with some degree of confidence when the mucous membrane alone is the seat of the disease, yet we must not conclude from their *absence* over the chest that the lungs are consequently healthy. Extensive disease, and even disorganization, as will appear from the sequel, may exist in the parenchymatous substance of the lungs, although no râle of any kind be audible, and in some of the diseases of the pleura, no sounds taking place within the lungs can be transmitted through the parietes of the thorax.

Asthma and Emphysema of the Lungs.—These two affections frequently exist together; and, as they are generally combined with catarrh, this is perhaps the best place to consider their physical signs, although it may not perhaps be in the exact order of their frequency of occurrence.

Laennec has described a variety of asthma unconnected with organic alteration of texture, in which the sound of the dilatation of the air-cells during respiration either remains perfect or becomes puerile; that is to say, as loud and distinct in adults as it naturally is in children. This variety, however, is cer-

* For further information on this point, see "A case of Cynanche Laryngea and Bronchotomy" in the 28th volume, and an article on "Bronchotomy" in the 29th volume of the Edinburgh Medical and Surgical Journal, by the late Dr William Cullen.

tainly very rare, and, on that account, of minor importance. In the common spasmodic asthma connected with pulmonary emphysema, on the other hand, along with more or less of the catarrhal râles, the respiratory murmur is either very faint or wholly inaudible over a great part of the chest; while the resonance or percussion over that portion either remains unaltered, or becomes preternaturally loud, and more or less tympanitic. When confined to one lung, the comparison between the physical signs furnished by the healthy and the affected side is generally quite decisive as to the existence of pulmonary emphysema. The only disease for which it might be mistaken, when confined to one side, and existing to a considerable degree, is pneumothorax. But from this it may easily be distinguished, either by the faint respiratory murmur still audible in many cases of emphysema, or by the slight catarrhal râles generally more or less heard over some part of the affected side. A peculiar dry crepitation described by Laennec under the name of *Râle crepitant sec à grosses bulles*, and conveying the impression of movement and friction between the pleura pulmonalis and costalis, is occasionally heard for a short time, and affords another diagnostic sign of this affection. It is peculiarly characteristic of that variety of emphysema, called, from its situation, interlobular; but it is unnecessary to allude to it further, as the affection which gives rise to it is very transient and comparatively unimportant. But as fluid effusion or empyema to a greater or less extent very generally goes along with pneumothorax, the co-existence of these affections furnishes other physical signs to be afterwards mentioned, which are so characteristic as completely to obviate the chance of confounding emphysema of the lungs with the presence of air in the cavity of the pleura. When, as more commonly happens, both lungs are equally affected, and no comparison can therefore be instituted between the two sides of the chest, the physical signs alone are perhaps less unequivocal as indicating the presence of emphysema; but when taken along with the ordinary symptoms, and with the filling up of the intercostal spaces, and the degree of dilatation of the chest which often occurs, especially in the more severe cases, they generally enable us to determine with sufficient precision the degree and extent, as well as the presence of a disease, of which we had previously no direct means of ascertaining the existence during life.

I may here observe, without taking into account the light thus thrown on the pathology of many cases of asthma, that perhaps the most practically useful and important application of the knowledge and insight afforded by the physical signs in emphysema of the lungs, is, that in a certain number of cases

of this disease, where the general and local symptoms very closely resemble those of confirmed phthisis, we are enabled to establish, with some certainty and precision, a diagnosis by which the ultimate prognosis in such cases is materially improved. This is a point to which I shall presently recur more fully.

Phthisis Pulmonalis.—We have seen in the cases of catarrh and emphysema, that the principal diagnostic signs furnished by auscultation and percussion are found to exist in the earlier stages, or even from the commencement of the disease, and the same remark is perhaps equally applicable to most of the diseases of the lungs or pleura. But this, unfortunately, is not the case in regard to phthisis. Tubercles in the earlier stages of their course, and especially in their miliary form, may be developed in great numbers in the parenchyma of the lungs; they may even have been to a certain extent softened and broken down, and they may have given rise to the most unequivocal symptoms of phthisis without our being able to detect their existence with any degree of certainty, by means of auscultation and percussion. And it has frequently happened that the disease has gone on to its fatal termination without having presented any other physical signs than those which accompany simple and slight chronic catarrh. This has been chiefly observed in those cases of extensive deposition of miliary tubercles, where the parenchymatous substance of the lungs in the interstices of the tubercles remains permeable to air, or becomes more or less emphysematous, and where the disease has proved fatal from the number of tubercles disseminated through the lungs, and before they have gone through their usual course. But even when they have coalesced,—when they have caused induration of portions of the lungs,—and when more or less of condensation has taken place in the pulmonary texture around them, the diminished resonance on percussion of that part of the chest where they are most frequently developed, and in greatest numbers, along with the diminished intensity of the respiratory murmur, its bronchial character, or its total absence over a greater or smaller extent of surface, are by no means unequivocal signs; and, if taken by themselves, would be quite insufficient to indicate with any certainty the presence of tubercles in that portion of the lungs, as they occur in many other cases where no tubercular deposition exists. It is only by their combination and comparison with the general concomitant symptoms, that they can acquire any value as diagnostic signs at this stage of the disease. We are, therefore, justified in assuming that auscultation and percussion furnish no certain indications of the existence of tubercles in the

lungs at that period of their course, when such knowledge might perhaps be attended with some practical advantage. But it would be both incorrect and unjust hence to conclude, that they can be of no use in establishing the diagnosis of phthisis. In the great majority of cases, they enable us sooner or later to determine with much more precision than we can ever hope to arrive at without their aid, the existence, the seat, the extent, and the progress of tubercular disorganization and ulceration in the lungs. It is by the physical signs which they afford alone that we can predicate the existence, the situation, and the extent of tubercular excavations; and this they sometimes enable us to do in patients, who have presented few or none of the usual symptoms of the disease. In ordinary circumstances, however, were we to trust exclusively to their indications without taking the concomitant symptoms into account, we should certainly expose ourselves to serious mistakes in regard to the existence or non-existence of phthisis.

Perhaps the most remarkable of these physical signs of tubercular excavations is that called *pectoriloquism*, from its peculiar character, and which may be aptly compared to the sound of the voice as heard through the stethoscope applied to the larynx or trachea. *When it is very evident and perfect*, this sign may be considered as pathognomonic of an ulcerated cavity in the lungs, especially when combined with another sign heard during respiration, and characteristic of air entering with some force a cavity communicating with the bronchiæ, and formed near the surface of the lungs, to which the name of *cavernous respiration* is well applied. These two signs are of course most evident and perfect when the excavation is of considerable size, and contains little or no fluid or softened tubercular matter. When it is partly filled with fluid contents, the cavernous respiration either alternates occasionally with, or is replaced by a loud mucous râle, which varies according to the quantity and quality of the contained liquid, but is evidently produced by the passage of the air through it into the excavation. When heard, like the two first mentioned signs, under the clavicle, in the axilla, or in the supra-spinal fossa of the scapula, the parts of the chest which correspond to the upper lobe of the lung where, in nine cases out of ten, tubercular disorganization and ulceration are the most advanced and the most extensive, it can generally be distinguished from that mucous râle which has its seat entirely in the larger bronchiæ, and is also frequently heard in phthisis. It is, as it were, an exaggeration of the common mucous râle taking place in the larger branches of the bronchiæ, and has been well named the *gurgling or cavernous râle*. By itself, this sign is not alto-

gether to be relied upon, even when taking place in the upper lobes, because, in certain circumstances, and especially when the substance of the lung is much condensed, and has thus become a better conductor of sound, a mucous râle having its seat in the bronchiæ, may resemble it so closely as to lead to the erroneous supposition, that a cavity exists in that part of the lung. On the other hand, the pectoriloquism and the cavernous respiration appear to be most perfect, and acquire their greatest intensity when the pulmonary texture around the excavations has undergone considerable condensation and induration, so that when combined with one or both of these, the cavernous râle may also be considered as a pathognomonic sign.

But pectoriloquism is frequently either imperfect or doubtful ; and when induration of the parenchyma of the lungs from accumulation of tubercles, or hepatization from pneumonia, or condensation from other causes, has taken place to any considerable extent, the sound of the voice, as transmitted through the diseased part, like the loud mucous râle in the larger bronchiæ, often acquires an unnatural intensity, which partakes more or less of the characters of true pectoriloquism, although, at the same time, no other sign of a tubercular excavation can be detected. To this resonance of the voice, which, however, is generally diffused over a larger surface than true pectoriloquism, Laennec gave the appropriate name of *bronchophony* ; and it is an important sign as indicating, along with the bronchial respiration and cough, that indurated and condensed state of the lung, in which it becomes a better conductor of sound. Imperfect or doubtful pectoriloquism, therefore, ought not to be relied upon, unless it shall be confirmed by the other signs, and particularly by the cough, which, from the full inspiration which precedes and follows it, not only renders the cavernous respiration and râle more distinct, but affords in itself another pathognomonic sign of tubercular excavations. Like pectoriloquism, the cavernous cough may be compared to the sound of coughing, as heard through the stethoscope applied to the larynx or trachea, and it is sometimes so loud as to produce a painful impression on the ear.

In a few cases where the excavation is large, and only partly filled with very fluid matter, another sound is heard during respiration, or on speaking or coughing, to which, from its very peculiar character, scarcely admitting of description, Laennec gave the name of *metallic* or *amphoric* resonance. Like the other physical signs of tubercular excavations, it varies somewhat in its character, according to the size, form, and situation of the cavities,—the thickness and disposition of their walls,—the number and connection of the bands which frequently traverse

them,—the mode in which they communicate with the bronchiæ, and the quantity and quality of the fluid they contain. But it may generally be considered characteristic of a vast excavation, formed near the surface of the lung; and the only other occasion on which it is audible, is in the case to be afterwards mentioned of empyema and pneumothorax, connected with a fistulous communication into the bronchiæ, where the conditions are nearly similar.

It has been already mentioned, that when tubercles are deposited in great numbers, and cause induration of a portion of the lungs, the resonance of that part of the chest on percussion is generally diminished; and it may be now stated, that when a large excavation is formed it sometimes becomes tympanitic. But the physical signs furnished by percussion are not constant, and are always liable to fallacy. Much reliance, therefore, cannot be placed on their indications alone in the different stages of phthisis. As, however, tubercular disorganization and ulceration seldom exist to the same extent in both lungs at the same time, the comparison of the signs furnished by auscultation and percussion, on both sides of the chest, furnishes important diagnostic information, and ought therefore never to be neglected.

The only material source of fallacy attending the combination of two or more of the physical signs of tubercular excavations, occurs in the case of that peculiar organic alteration of structure, first pointed out by Laennec under the name of *dilatation of the bronchiæ*, and which appears generally to be a consequence of long-continued chronic catarrh. When the dilatation is very considerable, and especially when it assumes the form of one or more cavities, the signs furnished by auscultation are very similar to those indicating tubercular excavations, while the concomitant symptoms resemble more or less those of phthisis. But this affection is comparatively very rare to this extent at least; and even when it does exist to a considerable degree, the pectoriloquism is seldom so circumscribed as in phthisis, but generally partakes more of the character of diffuse bronchophony. The sound of respiration also, and the loud mucous râle are more bronchial and less distinctly cavernous. Dilatation of the bronchiæ, moreover, when it does take place, is generally found to affect the greater part of the lung, or at least not to be confined to the upper lobe; while tubercular excavations, on the contrary, it is scarcely necessary to observe, occupy the summit of the lungs in the great majority of cases. Peripneumonic abscesses, and gangrenous excavations in the lungs are the only other morbid conditions in which these physical signs exist. But these cases are excessively rare, and when they do occur, they very seldom take place in the upper lobes, and the con-

mitant symptoms are generally quite sufficient to distinguish them from the tubercular excavations of phthisis.

It may be said, and I am by no means disposed to question the truth of the assertion, that all the knowledge thus acquired of the seat, the extent, and the progress of tubercular deposition and ulceration in the lungs, leads to no practical result of any consequence in the treatment of this destructive disease. But the same remark might be applied with equal justice to the investigation of the ordinary and functional symptoms, which have been carefully and minutely studied in all ages, with a view to an accurate knowledge of the disease, and hitherto with no better success in its treatment. The importance of ascertaining with some degree of certainty the presence of tubercles in the lungs, at any period of their course, cannot, I should think, be called in question. The general symptoms, however closely and accurately they may be investigated, do not afford in the earlier stages more decisive evidence on this point than auscultation and percussion; and it has sometimes happened that the physical signs have revealed the existence of tubercular excavations, where the concomitant symptoms had not even led to a suspicion of the presence of tubercles in the lungs. At this period of the disease the evidence furnished by the ordinary symptoms can only amount to a probability, greater or less according to circumstances; and this probability will be either strengthened or weakened by the addition of the evidence drawn from auscultation and percussion. In the more advanced stages again, we have seen that the evidence of the physical signs is more positive and unequivocal in a great majority of cases, than that of the concomitant symptoms.

But the absence of these indications is sometimes of equal or even of greater importance than their presence; and it frequently happens in the case of persons supposed to be in a very advanced stage of phthisis from the state of the general symptoms, that we are enabled to say with some degree of confidence, either that tubercles do not exist in great numbers, or at least that they have not caused induration or ulceration of the lungs to any appreciable extent. I have already alluded shortly to the practical importance of the indications furnished by auscultation and percussion, in those cases of asthma and emphysema in which all the concomitant symptoms very closely resemble those of phthisis; and I shall now endeavour to show the importance of their negative as well as their positive evidence in such circumstances, and to point out to what extent they may modify the diagnosis, and improve the prognosis in those cases of asthma with emphysema or catarrh, which as-

sume so exactly the form and general characters of confirmed phthisis.

It appears to me that this subject will be best illustrated by giving, in a few words, the essential particulars of one or two cases bearing directly upon the point. These are by no means solitary instances, and I only prefer them because they happen to be fresh in my recollection.

John Perry, *æt.* 27, formerly a soldier for some years, had been seen, before his admission into the Royal Infirmary under my charge on the 17th of January 1830, by Dr Alison, who, from the history of his complaints, and the state of his general symptoms at that time, considered it a case of confirmed phthisis, and on that account advised him to enter the hospital. On his admission, he presented the usual symptoms of the more advanced stages of phthisis. He had frequent cough, excited by a sense of irritation referred to the larynx; copious muco-puriform expectoration; sense of constriction without pain in the chest; respiration accelerated; pulse 120, and small; night sweats; debility and emaciation. He reported that he had been subject to cough with expectoration and shortness of breath, during the winter season for six or seven years previously, but that he had never experienced so severe an attack as the present, and that he had suffered two severe attacks of pain in both sides of the chest, one about a year, the other four years before admission. The only symptoms of phthisis awaiting in this case, it may be observed, were the appearance of blood in the expectoration, which he said he had never remarked, and diarrhoea; but neither of these is by any means a constant symptom of the disease.

On examination, I found that the sound on percussion was good over all parts of the chest, and even louder than natural in some places, while the respiratory murmur at the same time was every where exceedingly faint, and accompanied by slight catarrhal râles. No physical signs of tubercular induration or ulceration could be detected under the clavicles or in any other point. From this unexpected result of the investigation of the physical signs, I was immediately led to alter the diagnosis which I had previously been inclined to adopt. And by ascertaining the presence of very extensive emphysema and catarrh of both lungs, along with the absence of any signs of tubercular excavations, I was enabled to explain the symptoms satisfactorily, and in a way which permitted of a much more favourable prognosis, and even led me in some degree to modify the treatment.

The event has certainly so far confirmed the view of the case I was thus induced to adopt. He remained under treatment in the

hospital from the 19th of January to the 15th of February. During this period the symptoms gradually declined, and the catarrhal râles disappeared; and at the time of his dismissal, his cough and expectoration were much diminished; his respiration nearly natural, but easily accelerated; his pulse still rather frequent, and easily excited; his appetite good; and his strength improved. The respiratory murmur continued still very faint over the whole chest, while the sound on percussion was natural. I saw this man about two months afterwards, and examined him carefully. The respiratory murmur and the sound on percussion over every part of the chest remained as at the time he left the hospital. He had still some cough, and was subject to asthmatic paroxysms, and his respiration and pulse appeared to be habitually rather frequent. But he had gained flesh considerably, and he was able to pursue his occupation as a hawker of tea through the country, without suffering much fatigue.

Now I do not mean to assert that there are no tubercles in this man's lungs. I would only observe, that if the symptoms in this case had proceeded from a deposition of tubercles so general and extensive as to cause the very marked diminution in the intensity of the respiratory murmur which existed over the whole of both lungs, it is scarcely possible to conceive that the symptoms of an advanced stage of phthisis, under which this man laboured at the time of his admission into the hospital, should have abated so much as they certainly did, when he gained flesh and was able to resume his former occupation. And besides, the presence of tubercles in their miliary form to such an extent as to have produced this diminution in the respiratory murmur, would also have caused a diminution in the resonance of the chest on percussion; whereas we know that it was every where good, and even in some places slightly tympanitic.

The second case is that of Ann Mackenzie, æt. 28, and married, who was admitted into the clinical ward of the Royal Infirmary, under the care of Dr Graham, on the 8th of December 1829. This woman had been also seen by Dr Alison before her admission, and he considered her decidedly phthisical at that time. She reported that she had been subject to pectoral complaints for some years, and that about a year before her admission, she had taken measles in a severe form. At the time of her admission, she had constant pain in the left side of the chest, preventing her from lying on that side, and increased on full inspiration. She had frequent short cough; muco-puriform expectoration, occasionally streaked with blood; dyspnoea, with occasional fits of palpitation; irregular flushings of face; pulse above 100; night sweats; aggravation of all the symptoms in the evening; debility and emaciation. She had, besides, some dys-

peptic and hysterical symptoms; and she stated that she had been affected with amenorrhœa for sixteen months, but that at the menstrual period, her expectoration became more deeply tinged with blood.

Some time after her admission, I examined this woman, who was still supposed to be phthisical, at the request of Dr Graham and Dr Duncan, to whose charge she was at that time transferred. The left side, in which she had complained of pain at the time of her admission, appeared somewhat contracted, and was rather less elevated during inspiration than the other side—signs apparently of a former pleurisy, of which there remained no other symptoms, excepting perhaps that the action of the heart was more diffused and somewhat louder than natural; and that the respiratory murmur in some points laterally and posteriorly on that side was somewhat fainter than on the other. Under the clavicles, and in the upper parts of both lungs, as well as over the whole of the right side, it was quite natural and unaccompanied by any rale. The sound on percussion of the chest was also natural. No signs indicating the presence of tubercles or tubercular ulceration, could be detected under the clavicles, or over any part of the chest.

From the evidence thus obtained, I had no hesitation in saying, that no tubercular excavations existed in the lungs of this woman; and that I thought it very doubtful if any considerable number of tubercles were at that time present in her lungs. The event in this case, also, has hitherto confirmed the more favourable prognosis that resulted from the opinion I then hazarded. During her residence in the hospital, the pain, cough, expectoration, and other phthisical symptoms gradually abated; and when she left the Infirmary in February 1830, although she still suffered from dyspeptic complaints, and remained emaciated, the phthisical symptoms had entirely disappeared.

I saw this woman upwards of two months after her dismissal along with Dr Alison, and found that she had experienced no return of the phthisical symptoms, although she had occasional fits of asthma, especially towards morning. The respiratory murmur was perfectly heard over every part of both sides of the chest, with the exception of a portion of the lowest part of the left side, where it was only well heard on full inspiration, and where the sound on percussion over a small space was dull. These signs probably depend upon a degree of condensation of the corresponding portion of that lung, or perhaps upon effusion of lymph on its surface, consequent upon the former pleurisy, as that side still remains somewhat contracted. Her respiration and pulse were of natural frequency; her catamenia had lately reappeared; her general health was much improved; and she had gained flesh.

This, which I would have called at the time of her admission a case of asthma and catarrh, probably connected with amenorrhœa, differs considerably from the first, and especially in regard to the state of the respiratory murmur. The diminished intensity of the sound in the one case indicates the presence of emphysema, while in the other its perfect character precludes the idea of emphysema in the lungs to any extent, and would rather lead to the supposition, that it may be one of those cases described by Laennec under the name of Asthma with puerile respiration. I will not assert in this case any more than in the first,—that there are no miliary tubercles in the lungs of this woman; and it is very possible, although none may exist at present, that, from her asthmatic tendency, they may be hereafter developed there, and give rise to the unequivocal signs of phthisis. But I think I am justified in affirming, that they certainly do not exist in great numbers; and that, from the state of her general health, and the character of the respiratory murmur, there is a strong probability at least, that at present no tubercular deposition exists in her lungs.

These two may probably bring to the recollection of those who have had a good deal of experience in diseases of the lungs, other cases where similar unexpected, and perhaps still more complete recoveries from a train of symptoms indicating phthisis in its advanced stages have taken place, and which may perhaps admit of the same satisfactory explanation.

I may here mention the principal circumstances of a somewhat similar case, in which the accuracy of the diagnosis, which had been thus modified, was subsequently confirmed by examination after death. Mary Carmichael, æt. 25, was admitted into the clinical ward of the Royal Infirmary, on the 3d of November 1827, under the care of Dr Alison. Her chief symptoms at that time were pain of left side, increased on coughing or full inspiration; frequent cough and dyspnœa, with copious expectoration, at first of a grayish colour, afterwards more yellow, opaque, and puriform; diarrhœa, with occasional pain of abdomen; pulse above 120, small and feeble; heat as high as 102°, with other febrile symptoms; countenance pallid; œdema of the lower extremities; great debility and emaciation. She reported that the catamenia had not appeared for four years; that about a year before she had hæmoptysis; that the diarrhœa had commenced with rigors about three weeks before her admission; but that she had become gradually weaker and more emaciated ever since she had been affected with amenorrhœa.

This train of symptoms was sufficient to excite a strong suspicion of confirmed phthisis, and accordingly, she was at that time supposed to be decidedly phthisical. During her residence

in the hospital I examined the state of her chest several times. The left side over the middle and lower parts of which the sound on percussion was dull, was less elevated during inspiration than the right, while the subcrepitating and mucous râles with bronchophony and bronchial cough, all indicative of condensation of the pulmonary substance, and effusion into the smaller bronchial ramifications, were heard posteriorly on that side. But no physical signs of the presence of tubercles in any part of their course could be detected under the clavicles, where, as well as over the whole of the right side, the respiratory murmur was pretty natural. This of course led to a material alteration of the diagnosis, and a somewhat more favourable prognosis. These physical signs underwent a partial change after some time. The motion of the left side remained imperfect, and the sound on percussion of the lower part was duller than over the right; but the respiratory murmur was better heard, although accompanied for a time by a loud dry crepitating râle, and a *fremitus* conveying the sensation of friction, felt during inspiration on the application of the hand, and indicating the existence of pulmonary or interlobular emphysema. The general symptoms also underwent a considerable change, and became complicated with those of an organic affection of the brain. The pain of side soon abated under the antiphlogistic treatment, but the cough and dyspnoea, frequently coming on in violent paroxysms, continued for a long time unabated, with copious expectoration, which, however, latterly lost the puriform character it at one time possessed. The diarrhoea proved very intractable; the debility and emaciation were extreme; and she had occasional epileptic fits, and transient attacks of difficult articulation.

During a residence of upwards of five months in the hospital, however, these urgent symptoms gradually declined, and at the time of her dismissal on the 25th of April 1828, she was free from cough or dyspnoea; and, although still emaciated, the diarrhoea had abated; the pulse had become nearly natural, and her appetite was good. The difference in the movement of the two sides on inspiration was still evident, but the respiratory murmur continued to be better heard posteriorly on the affected side.

This woman was again admitted under the care of my colleague, Dr Christison, on the 4th of August 1829, labouring under her former pectoral symptoms, and her expectoration was now tinged with blood. She had also considerable anasarca and ascites, with scanty urine of low specific gravity and highly albuminous. During the time she was under the charge of Dr Christison, her pectoral symptoms continued nearly as formerly,

and were latterly accompanied with vomiting and diarrhoea. She had one distinct epileptic fit, and when she was transferred to my charge on the 4th of September, two or three days before her death, her articulation was very slow, and her faculties seemed impaired. She was in the last stage of debility and emaciation, which prevented an accurate examination of the chest.

On examination after death, organic disease of the brain, and the usual alteration of structure in the kidneys where the urine has been coagulable, were both found to exist. There was considerable condensation, as if from former pleurisy, and even partial hepatization of the lower lobe of the left lung, and there was also some partial condensation of the right lung; but after minute and careful examination, I could not discover any traces of tubercles or tubercular deposition in any form.

From such cases as these, and they are by no means rare, and from what has been already stated, I think we may be justified in coming to the general conclusion, that auscultation and percussion do furnish some practically important diagnostic signs, by which the prognosis is materially influenced, both in genuine phthisis pulmonalis and in those affections of the lungs which resemble phthisis so closely in their general symptoms and characters, that the ordinary mode of investigation is frequently quite inadequate to distinguish them from this fatal disease.

My limits will only permit me barely to allude to the other diseases of the chest in which auscultation and percussion may be employed with advantage; and this is the less necessary, as what has been stated in regard to catarrh, asthma with emphysema, and phthisis, may be considered as a fair specimen of the general utility of these methods of investigation, and nearly all the physical signs which they furnish have been mentioned and described in reference to these diseases.

In *Pleurisy* with fluid effusion, in addition to the dull sound on percussion of the affected side, the bronchial respiration in the commencement, and the total absence of respiratory murmur in the more advanced stages, a peculiar modification of bronchophony, in which the tone of the voice becomes shrill and tremulous, is occasionally heard through the affected side, and principally towards the angle of the scapula. It has been called by Laennec *Egophony*, from its supposed resemblance to the bleating of a goat. But it can only take place when the effusion is moderate, generally in the commencement and in the decline of the disease, and it is very transient; and although very characteristic when pure and well marked, it is comparatively rare, and passes by such insensible gradations into

bronchophony, that we cannot generally place much reliance upon it as a diagnostic sign. The physical signs of simple empyema and of hydrothorax are of course the same as those of pleurisy.

In *Empyema* with *Pneumothorax*, the *metallic* or the *amphoric* resonance already mentioned, heard during respiration, or upon coughing or speaking, is quite pathognomonic of a fistulous communication between the cavity of the pleura and the bronchiæ, whether this may have been the consequence of ulceration proceeding inwards from the pleura, or of a tubercular excavation extending outwards. A knowledge of the existence of a fistulous communication is the more important, as it bears directly upon a practical point, such cases being the least favourable for the operation of paracentesis. This is so well understood, that I scarcely think that any surgeon would now hazard this operation on his own responsibility without a previous investigation of the physical signs; and to show that the case is by no means so rare as has been generally supposed, I may mention that three instances have lately occurred in the wards of the Royal Infirmary within as many months, in all of which the three morbid conditions of the disease, pneumothorax, empyema, and fistulous communication with the bronchiæ, were predicated during life. The dull sound on percussion of those parts of the affected side which are most depending, and the tympanitic sound on percussion with absence of the respiratory murmur in those which are highest, according to the posture assumed by the patient, are quite pathognomonic of empyema and pneumothorax, and entirely supersede the necessity of employing the *succussio Hippocratica* as a diagnostic sign.

Pneumonia is a much rarer disease, even among the lower orders who are most exposed to its exciting causes, than is commonly supposed, and on this account I have deferred till now any notice of its physical signs. Of these by far the most important and characteristic is the *crepitating râle*, so called from the sense of minute crepitation which it conveys, and which is aptly compared to the sound produced by pressing a portion of healthy, or still better, of œdematous lung gently between the fingers. It evidently takes place in the smallest ramifications of the bronchiæ and the air-cells, and appears to be caused by the passage of many very minute air-bubbles through the viscid mucus, commonly tinged with blood, which is secreted there and generally considered characteristic of pneumonia. The crepitating râle passes by insensible gradations into what is called the subcrepitating, and from that into the mucous râle, and the three varieties are frequently heard at the same time.

More or less of the crepitating râle generally accompanies the earlier stages of well-marked pneumonia; as the disease advances it generally passes into the others, which have their seat in ramifications somewhat larger; and when condensation or hepatization has taken place, which is known by the absence of the natural respiratory murmur, with the presence of bronchophony, bronchial respiration, and bronchial cough, it is no longer heard. But, besides that this sign is often of short duration, it cannot be altogether relied upon as in itself indicating pneumonia, even in the earliest stages, because it also occurs as a sign of œdema of the lungs, and in that peculiar affection, consisting in circumscribed condensation and induration of portions of the lungs, from partial effusions of blood, and described by Laennec under the name of pulmonary apoplexy. *

I have thus endeavoured to point out, without exaggeration and without prejudice, the claims of auscultation and percussion to general attention, and the amount of advantage we can reasonably expect to derive from their use in the investigation of the diseases of the lungs and pleura. I feel pretty confident that I have not overrated their general utility, and if it shall appear to any that full justice has not been done to their merits and importance, I can only say in the words of M. Andral: —“ Certes, il est loin de notre pensée de vouloir déprécier la méthode de l'auscultation, l'une des plus belles et des plus ingénieuses découvertes qui aient été faites en médecine depuis longtemps. Nous cherchons au contraire à la rendre plus utile, et d'une application plus pratique, en n'en exagérant pas les avantages, et en indiquant avec précision ce qu'on peut en attendre.” †

And in regard to the influence which these additional means of investigation have exerted, or may hereafter exert, upon the ultimate object of all our knowledge of disease, although we cannot go so far as to say with Hippocrates, “ Medicus, siquidem suffecerit ad cognoscendum, sufficiet etiam ad sanandum; ” yet I think we may conclude with the rationalists, “ Quem morborum origo et primordia fefellerunt, is minus recte curam suscipit.”

* In the foregoing pages I have avoided all allusion to auscultation as applied to the investigation of the diseases of the heart and great vessels—not because it does not afford new and perhaps important information in these affections, but because the indications furnished by auscultation *alone* have not, as Laennec has himself observed, been found as yet invariably connected with any one organic lesion or morbid condition of these parts, and have been frequently found to exist where no organic disease has been detected; and therefore the evidence which it furnishes in these cases cannot be considered as partaking of the same positive character as that which we derive from this mode of investigation in the other diseases of the chest.

† Clinique Médicale, Tom. iii. p. 582.

ART. III.—*On the Efficacy of Mercurial Purgatives in Purpura, whether Simple or Hemorrhagic; and on the circumstances which justify Blood-letting in these Diseases.*

By WILLIAM HARTY, M. D. Physician to the King's Hospital, and to the Prisons of Dublin.

MY attention had been painfully drawn to this singular disease at an early period of my medical career, by the fatal termination of the first case of that affection which had fallen under my care. The Meath Street Dispensary, to which I was attached for four years, supplied me with frequent opportunities for subsequent observation, and with ample compensation for the painful result of my first essay, in the uniform success which, as yet at least, has attended all my succeeding efforts. In the reports of that institution for the year 1807, (published in the Fifth Number of the Dublin Medical and Physical Essays,) I mentioned that fatal case; and then, for the first time, announced the success which attended a still more unpromising instance of the disease, when treated by a *free use of purgatives*. In a subsequent report, published in the sixth and last number of those Essays for June 1808, I detailed two additional cases, in which the exhibition of calomel and jalap proved speedily successful; and when my friend Dr Bateman was preparing for publication his Synopsis of Cutaneous Diseases, I furnished him with a short account of my experience of the purgative plan in purpura, which account he published in the Edinburgh Medical and Surgical Journal for April 1813.* At that period I had not met with any instance of the disease which required or would justify blood-letting in any shape, more especially as I found purgatives of calomel and jalap, given for several successive days, fully adequate to the removal of the

* I am not aware, that previously to this date purgatives had ever been expressly employed as a means of subduing this disease. A tonic or antiscorbutic plan of treatment had been generally relied on, until Dr Parry in 1809 strongly enforced the necessity and advantage of venesection in certain cases. From an observation of Burnerius, indeed, it would appear that Strack proposed strong cathartics as a proper remedy for the disease, on a supposition that it originated from vitiated bile in the *prima viæ*, and from a tenacious mucus adhering to the intestines. It was a mere suggestion, then, neither approved of nor acted on, though subsequent events have proved the propriety of the practice, if not the correctness of the opinion. After the publication of 1813, testimonies poured in from various quarters of the efficacy of the plan I had recommended, though in many instances without any reference to the source whence the recommendation came. From Dr Bateman, to whom the intimation was first made, I received ample justice; and to Mr Plumbe I must express my acknowledgments for the flattering terms in which he refers to the details with which I had furnished Dr Bateman.

complaint, without the aid of any other remedy. At that period, too, my opinion was, that the efficacy of these medicines depended solely on their purgative operation, the improvement of the patient being in general so evident and immediate after each exhibition. My impression on that account was, that other active purgatives, without the mercurial, might be equally efficient, though I was reluctant, for the sake of the experiment, to desert a formula I had found so successful in a disease at times so dangerous, or at least so alarming. Subsequent experience has led me to doubt the correctness of this impression, and to believe that the mercurial influence of the formula I had adopted was not inoperative in contributing to a rapid convalescence. Notwithstanding the success which had so uniformly attended my purgative plan of treatment, I entertained too great a respect for Dr Parry's authority, to doubt that there were cases of this disease of an inflammatory character, demanding, in some instances, the free use of the lancet. I was therefore anxiously on the watch for a case of the kind, being determined to treat it accordingly. Three cases of this description have since fallen under my observation; and I now propose to detail these, and such other cases as either demanded some modification of the plan of treatment I had previously pursued, or are calculated to furnish useful deductions.

Since the publication of Dr Parry's *Cases of Purpura* in 1809, and of mine in 1813, the former successfully combated by venesection, the latter by purgatives, the disease has attracted very general notice, and the periodical journals abound with histories highly interesting and instructive. As this disease, however, presents itself under every variety of form, degree, duration, and danger, some cases being so trivial as scarcely to require the aid of medicine, whilst others demand the greatest decision and foresight, and every help that skill can supply, it is not only desirable but necessary, to bring together the scattered facts on record, and endeavour, after a strict analysis and comparison, to ascertain whether they furnish satisfactory data for distinguishing the several forms of the disease, and for fixing their distinctive characters, causes, and mode of treatment. I further propose, therefore, to make such an attempt, and to lay the foundation at least for a successful superstructure by abler hands.

But before I commence the execution of this task, I must first submit the details of a few remarkable cases, in illustration both of the different forms under which the disease presents itself, and of the modified treatment which each required. The *first* case furnishes a good example of the acute and febrile

form of purpura hemorrhagica, and of the striking efficacy of mercurial purgatives, in bringing it to a rapid crisis, without the aid or intervention of any other remedy whatsoever. The *second* is a remarkable specimen of chronic purpura, connected with hepatic disease; and the *third* evinces the combined efficacy of purgatives and blood-letting, in a form of purpura differing in several respects from both. The first occurred about a year after I had communicated with Dr Bateman. On the second I was consulted by letter about the same period; and with the particulars of the third I was furnished by my valued friend, Dr Morgan, physician to the Whitworth Hospital, who honoured me by the request that I would attend the case with him.

CASE I.—Miss F——, 12 years of age, of sallow complexion, and not of a robust frame, lately convalescent from tedious chin-cough, complained while at school of pain in the belly, accompanied by a ravenous desire for food. On returning home, she ate heartily, and after a time the pain subsided. During the night she slept well, though she occasionally complained of an itching sensation over the whole of her body.* It was remarked that she had a cold and clammy sweat, the smell of which, as well as of her breath, was very offensive. She arose in the morning without complaint of any kind, but her friends were surprised and alarmed at the extraordinary appearance she presented, the face and body being covered with petechiæ and blotches of various size and colour. The urine was of a dark-red colour, and the bowels costive; in other respects she felt perfectly well, without headach, pain, or lassitude; her appetite was good, her spirits cheerful, and she had no feeling of illness. I visited her the day after, and found her in the act of eating a hearty dinner. The petechiæ and blotches covered the face, body, and extremities so extensively, as scarcely to leave a portion of the natural skin visible; the tongue and fauces, as far as could be discerned, were covered with similar maculæ, all of a dark purple hue, inclining to black; and on the scalp, at the roots of the hair, several were eminent above the surface, forming dark purple hemispheres of the size of half a pea.† The pulse was 100, hard, and somewhat wiry; the bowels costive; the belly tense, but free from pain; the urine high-coloured, and tinged with blood; the tongue clean; the heat of skin natural. Animal food

* Dr Bateman states that "no itching or other sensation attends the petechiæ."

† Dr Bateman states, that in the few cases in which this elevation of the cuticle into a sort of vesicle containing black blood occurs, it more frequently happens on the tongue, gums, palate, and inside of the cheeks, where the cuticle is extremely thin. In this instance the case was reversed, as the elevation occurred where the cuticle was thickest.

was interdicted, and 3 grains of calomel, with 20 of rhubarb, ordered with an enema. By these means the bowels were freely opened, the fæces being black, and of a thick viscid consistence, streaked with blood, and highly offensive. On the following day (1st March 1814,) she had passed no urine, but in its place about a pint of florid blood, (which had partly coagulated,) devoid of all urinous smell. Her sputa were tinged with blood, and from the centre of some of the maculæ a small quantity of blood had exuded. On each side of the nose, and under the inner angle of the eye, there was extensive ecchymosis, as if produced by a blow. There was a similar ecchymosis under the knee, and the skin over the glutei muscles became black from the pressure of sitting. A large black tumour had also appeared on the scalp, near the sagittal suture. The pulse was 140, not full, but hard; the skin hot; thirst considerable; and the tongue foul; the appetite, however, was good, and the sleep undisturbed.

Having at this time every confidence in mercurial purgatives, I was determined to employ no other means unless they should appear to fail, and therefore merely directed 8 grains of calomel, 6 of rhubarb, and 4 of scammony, to be followed by an infusion of senna and salts. These means produced three copious stools, the second being more natural in appearance, and less mixed with blood; the last very dark and fetid; the urine less bloody, and of very offensive smell. She had epistaxis in the morning of the second, and the head felt "light and dizzy;" the maculæ, particularly on the forepart of the neck, had increased in number and size; those on the tongue and fauces had subsided; ecchymosis was visible on various parts of the body, and blood continued to ooze from the centre of the maculæ, staining her linen; the sensation of itching had increased; the pulse was 130, more feeble; her appetite had declined; she complained of much lassitude, and had been obliged to lie down during the course of the day. *The same medicines were repeated.*—On the 3d March she had one copious motion, dark-coloured, but more natural and consistent; the urine was turbid, and depositing a dark sediment, but unmixed with blood. Hæmatorrhœa has altogether ceased; the ecchymoses have almost disappeared, as well as the maculæ on the tongue and fauces; those on the body are little altered in number or colour; the pulse 120, and stronger; no languor or complaint of any kind. *The same medicines were repeated this day.* On the 4th March, the fæces were natural; the urine transparent, but depositing a lateritious sediment; maculæ fading fast; pulse 120, firm, and strong; belly still hard; tongue clean; and appetite good; complains of a bitter or bad taste in her mouth. *The same medicines repeated.*—On the 5th March, the fæces and

urine were quite natural, and the petechiæ were scarcely discernible; complains of sore mouth, with some pyalism. Medicines discontinued. A warm bath ordered, from the use of which, every second day, she derived much pleasure and benefit; and in a few days there was not the slightest trace of disease to be discerned. Skin and complexion clear; pulse 80.

The Rev. Robert Walsh, (then curate of Finglas, afterwards chaplain to the English embassy at Constantinople, and author of an interesting journal from thence to England,) anxiously watched this case during its whole progress, which he regularly noted. The statement now given is taken from his notes, and I must add, that he was the first to notice a remarkable difference between the pulse of the right and left arm in this patient, that of the former being much more feeble and irregular throughout the whole course of the disease, and in itself calculated to deceive and alarm the medical attendant, whose attention might chance to be confined to that wrist only.

The whole duration of this case was eight days, during the last five of which the patient was under medical treatment. Can reasonable doubt be entertained that its rapid and favourable termination is fairly attributable to the treatment? It is true that the disease, though sometimes fatal, has yielded under modes of treatment altogether different, and it is equally true that the disease itself differs much in character, cause, and duration. Yet let reference be made to the many cases on record, managed on different principles, and we shall find results far less rapid and satisfactory. We shall find that the duration of the disease often exceeded a month, and that the efficacy of the remedial means employed was in general very problematical.*

* Lister, in his *Exercitatio Med. de Scorbuto*, records twelve several cases as of that disease. From his description, however, it distinctly appears that of these twelve cases four were purpura hæmorrhagica, and three purpura simplex: the five remaining cases, three of which ended fatally, appear to me to have been neither purpura nor scurvy, though amongst the ancient physicians they might well pass for the latter most comprehensive disease. The three cases of purpura simplex terminated favourably, one of them by venesection, under circumstances I shall hereafter notice. Of the four cases of purpura hæmorrhagica, three were fatal. The fourth bears a very close resemblance to the case I have just detailed, and, as a specimen of the identity of the disease more than 150 years since, I subjoin a few particulars. "Puer sex annos natus, subito nigro-purpureis maculis per universum corpus affectus est; de capitis dolore leviter tantum querens, foras toto eo die ludebat; naribus tamen paululum sanguine stillantibus, omnino non febricitabat et cibum pro more avidè appetebat; ejus parentes insolitas maculas mirabantur; media nocte sanguis e naribus copiose profluebat, eundemque adeo grumosum e ventriculo vomebat. Maculæ in labiis et lingua, item per ejus femora longæ et latæ, *velut ex verberibus vibices*; pulsus rarus et debilis, urina succinea et qualis sanorum, nulla sitis. Ad fluxum sanguinis comprimentum plurima frustra adhibita sunt; venâ autem brachii incisâ, is protinus in deliquium, vix 3iss. sanguinis effusa, lapsus, et sanguis e naribus per se protinus compressus est. Sudore frigido madebat et deliravit." *Diacodium* et *antiscorbutics* were administered, under the use of which, "Vibices primum, mox maculæ in labiis reliquoque corpore *sensim* disparuerunt."

In the instance before us it may admit of a question, whether the rapidity of the cure was not mainly attributable to the specific action of mercury in affecting the secretions, as the moment of marked convalescence was contemporaneous with the affection of the gums, though obvious and decided amendment had been previously manifested under the influence of the mercurial purges. On this subject I shall dwell more at large when discussing the very important and interesting question of the Milbank Penitentiary Epidemic, which I had an opportunity of witnessing by means of an order obtained from the Secretary of the Home Department, and which, from such observation, as well as from subsequent reflection on Dr Latham's admirable description, I could only consider in the light of a mean between scurvy and purpura, to each of which it was closely allied.

CASE II.—This interesting case of chronic purpura, I shall give nearly in the words of the very accurate communication, on which I had the honour of being consulted. It is dated February 1814.—“Miss A. is six years and four months old, is naturally of a delicate habit and slight form, both considerably increased from the great quickness with which she has grown, and is still growing. At the age of three years she was attacked severely by a diarrhoea, terminating in dysentery, that lasted altogether about two months, and left a weakness in the bowels, with considerable relaxation of them, which was always reproduced by any extra quantity of fruit being given. In August last she was attacked by jaundice, not in a severe degree, which gave way in about three weeks to calomel and other purgatives. She was completely restored by taking the raw yolk of an egg in the morning fasting, for about a month. After this she grew fatter, and looked better and stronger than she ever had done before, (since the dysentery,) when in an apparent state of the most perfect health, with good appetite, good spirits, and every other indication of health possible, her maid observed her in the morning, (December 29, 1813,) upon taking her out of bed, after a perfectly good night, to have several very minute purple spots on her legs, thighs, and arms. A dose of calomel with a purgative having been given, a decoction of cinchona with sulphuric acid was prescribed, and a liberal diet enjoined. In the evening of the following day, a languor, almost amounting to fainting, came on, and was followed by a great increase of the eruption on the legs, which were swollen, and put on a livid appearance. Bark and wine were administered liberally, and persevered with till the 7th January, when considerable tendency to inflammation about

the chest, with heavy cough and expectoration, together with swellings about the muscles and joints, (as in acute rheumatism,) indicated the necessity of discontinuing them, and of adopting the antiphlogistic plan.* Occasional doses of calomel, and purging frequently with the *Magnes. Sulphat.* were had recourse to, and with advantage, so that at the end of a month; during which the symptoms continued with more or less violence, the crops of eruptions were much less frequent, and the disease appeared altogether much abated. It was accompanied all this time with a considerable swelling of the muscles of the legs, thighs, and arms, as well as of the cheeks and head; a bleeding of the spots on the ancles, which continued running sores for about three weeks, but are now healed; a slight discharge of blood from the lungs, stomach, and nose, and also for a short time from the bowels. All these symptoms apparently gave way in some degree to purging with calomel and jalap, repeated as frequently as the bowels could bear it, without producing acute pain. In the course of seven weeks five days was the longest interval that ever occurred without copious purging, and this remedy was frequently had recourse to every second or third day. Notwithstanding the apparent abatement of the complaint, it still continued to linger and re-appear, though in a mitigated state, and as there was now (February 9th) much emaciation and debility, the decoction of bark *alone* was given, and a more liberal diet resorted to without wine, the purges being occasionally continued. But as repletion advanced in the system, and strength and flesh returned, the complaint again made its appearance, nearly with its original virulence; the spots, though not so large, wore a more livid appearance, and showed in the centres a greater tendency to bleed than at first; but we observed at this time that the swellings of the muscles had *most considerably and decidedly abated*. The appetite during the last fortnight of this period was good, the sleep also perfectly sound,—in short, there was a total absence of fever, although the pulse was at times high. This induced us to recur immediately to the calomel and jalap, which have been administered for the last ten days every second day, with evident good effect to the spots, but with *considerable recurrence of the swellings*, with pain and some cutaneous inflammation. The purges acted briskly, and in all respects properly.

“Previous to the appearance of the inflammatory symptoms, the pulse was about 80, feeble; during the inflammatory state

* This would have been the proper period for moderate blood-letting, according to Dr Parry's judicious views.

it ranged from 90 to 130, not full, and is now (February 22d) 100, and not strong.

“Considering the natural constitution of the child, and the severity of the indisposition she has sustained, together with the operation of the strong medicines she has taken, her general health and strength have certainly not failed so much as might have been feared or expected, though of course she is much reduced.

“We observed during the first periods of the complaint (for about five weeks) a *total abstinence* from animal food, and the child chiefly lived on a small quantity of bread and tea, the stomach rejecting almost every other kind of slop.

“It is to be observed, that the complaint has now lasted *eight weeks*.

“Under these circumstances, and considering the natural delicacy of the child’s constitution and habits, as well as her early age, should the disease not be subdued by the practice we have pursued,—would bleeding, as recommended and practised by Dr Parry in two cases of purpura (*in adults*) be advisable? Or, in the event of Dr Harty’s approving neither of a continuance of the practice we have pursued, nor of bleeding, *what would he recommend?*”

My answer to this communication was to the following effect, viz. that the opinion I had formed of this singular disease was, that it *most generally* originated in a peculiarly disordered state of the alimentary canal or abdominal viscera, and that this state is most certainly and expeditiously obviated by a regularly continued system of purging for several successive days. That under this plan of treatment I had usually found the alvine evacuations either black or dark-coloured, and in general highly offensive, and that, when they changed to a more healthy character, the disease began to disappear. As very active purging, however, would seem to have been employed in Miss A.’s case, a question very naturally arose why it was attended with such partial and imperfect success. This failure I thought might perhaps be justly attributed to the separate or combined operation of several causes, *first*, to the purging being “copious” and interrupted; *secondly*, to the early and (as it appeared) injudicious exhibition of cinchona and wine, thereby inducing an inflammatory diathesis, afterwards not sufficiently subdued; *thirdly*, to the probable existence of hepatic obstruction, evidence of which was supplied in the previous jaundice, in the effects of bark and wine on the system, and in the unusual obstinacy of the disease under the purgative plan of treatment, which, though it relieved, did not cure.

Under this view of the case I recommended, *first*, that, agree-

ably to Dr Parry's practice, the inflammatory or febrile state (if it exist) be obviated by taking six or eight ounces of blood from the arm. *Secondly*, That the system of purging be moderate and not interrupted, but continued from day to day until the alvine discharges assume a natural appearance; the daily evacuations not to exceed two or three, in reasonable quantity; the purgatives to consist of two or three grains of calomel, combined with jalap, rhubarb, or scammony, with the aid of liquid medicine if necessary. Should this plan fail of complete success, I concluded that obstruction or other disease must exist in the hepatic system, and therefore advised a trial of three grains of blue pill, and one of calomel, for several successive nights, keeping the bowels moderately free at the same time, and guarding against salivation.* I further advised a diet moderately nutritious, with exercise in the open air and the occasional use of the warm bath. I concluded by requesting further information as to the appearance of the alvine and urinary discharges at different periods of the complaint, and a more precise description of the swellings said to affect the joints and muscles;—whether they were œdematous or strictly analogous to those of acute rheumatism; whether the pain was experienced on motion or pressure of the part, or felt without the agency of either; and also what parts were chiefly affected by "cutaneous inflammation?"

The answer to these inquiries is dated March the 29th, embracing a period of five weeks, and is as follows:

"From the date of the last report (February 22d) to this time (March 29th) Miss A.'s complaint has assumed various aspects, and although at this moment considerably lighter than it has been at intervals since I last wrote, yet I fear that it is only dormant, and that, whatever its latent cause may be, it still remains unsubdued, though evidently mitigated.

"In two days after my last report we were induced to desist from all medicine whatever, owing to the weakness of the child,

* At this period, notwithstanding the obvious indications furnished by this case, I entertained a dread of exciting the mercurial action in purpura, as Miss F., in whom it occurred, and with such apparent benefit, had not at this time come under my care. My mind indeed was not altogether relieved of apprehension on this point until I had read Dr Latham's most interesting statement of the Millbank Penitentiary disease, and of the exclusive efficacy of mercury in it. Though I ventured to recommend mild mercurial alteratives, with the caution of "guarding against salivation," I now feel persuaded that, were I consulted in a similar case, I would, besides moderate purging, recommend, that the gums should be made sensible to the mercurial influence; and that, should any difficulty be experienced in accomplishing that point, the sulphate of quinine be administered in conjunction therewith, in order to expedite the mercurial action. Subsequent experience has contributed to confirm, certainly not to refute, the opinions advanced by me on this subject, and which the reader may find in a paper published in *Edin. Med. and Surg. Journal* for October 1829.

and adopted a more nutritious aliment, accompanied by a moderate use of good malt liquor. We found these kept the bowels moderately open, and the secretions in a healthy state. It will be right here to observe, that at the commencement of the child's illness, an active dose of calomel was the first thing resorted to, the evacuations produced by which were of a *clay colour*, and indigested, giving every indication of an imperfect biliary secretion. From this time, however, throughout the complaint no visceral disease has been indicated.

"From the period of the above-mentioned change the child has visibly from day to day gained strength and healthy appearance, the spots appearing each time they came out less in number and size, and of a less livid hue, though much inflamed. Their absorption was more rapid, and at last, in the course of ten days, they *altogether* disappeared. We then flattered ourselves with the prospect of a complete recovery : but alas ! the vile complaint returned with a suddenness and a violence nearly as formidable as ever. It came on (March 14th) while the child was at dinner, to which she sat down in good spirits, and with a good appetite, both of which she was deprived of almost instantly. She fell into a universal lassitude, complained of sickness at her stomach, and pain in all her limbs, of the use of which she was nearly deprived by night, they being extremely swollen, particularly her ancles, and covered from her hips downwards, and from her shoulders to the ends of fingers, almost as thick as they had ever been, with spots running into one another, forming large blotches ;—in short, there was a complete recurrence of the complaint. It is to be observed, the pains in the limbs and nausea above-mentioned, subsided within an hour after the spots were thoroughly out.

"We now had immediate recourse to the system of treatment prescribed by Dr Harty, and hitherto with the happiest effect. After adhering for four days successively (March 15th, 16th, 17th, and 18th,) to the use of small doses of calomel and jalap, we found the spots reduced in number and size each evening, but the ancles and feet swelled very much, with considerable inflammation ; this last symptom being greater and more distressing than at any other period of the complaint. The swellings came on with a very surprising and peculiar quickness, and were uniformly attended with a sensation which gave the child notice of their approach, and afforded us frequently an opportunity of almost seeing the muscles of her arms, feet, and fingers swell. Where the pain allowed of pressure, it pitted from the touch, chiefly, however, on the *feet* and *ancles* ; but when the skin was not touched, and the child remains quiet, she only complained of the sensation of *great tightness* of the skin. Always

at bed-time this symptom was worst, and generally by morning *entirely* disappeared, leaving a slight tenderness. These swellings of the ancles and feet have generally been accompanied with inflammation, but they have gradually given way within the last week to the system of gentle and daily purging. The quantity of calomel and jalap taken in the four successive days above-named, was ten grains of calomel and thirty grains of jalap, divided into four doses. The discharges were very proper as to quantity, and twice each day; in colour certainly dark, but not otherwise unhealthy.

"During the foregoing vicissitudes of the complaint, the pulse has varied from 80 to 90, and has always been feeble. At no time has there been the slightest appearance of fever. The child's appetite is very good, and she sleeps as if in perfect health.

"March 28th, Some accession of the complaint having appeared, we are now again pursuing the above plan of gentle and continued purging.

"29th, The swellings have for the last ten days been totally confined to the feet and ancles, and have been attended with a great disposition to perspiration in the feet, more so than at any former period in the hottest weather, when the child was in health. As the weather has become mild, she has been taken out, and has always appeared revived by the exercise and air.

"The principal object of this report is to make Dr Harty acquainted with the progress and variations of this extraordinary complaint, as we feel perfectly satisfied with the correctness of his judgment contained in his former directions.

"The weather has hitherto prevented our using the warm salt bath, and we request to know, if, in a further progress towards convalescence, the continued use of the warm bath is advised; and also, whether Dr Harty would recommend, at any period of the summer, the use of the cold sea bath. The child did last May and June use the cold sea bath with *apparent* good effect."

My answer to this communication may be concisely given: It was to the effect,—That the whole history of the disease tended strongly to confirm the suspicion I had previously entertained of the hepatic source of the affection: a suspicion supported by the character of the motions, by the cedematous swellings, and by the effects of a nutritious regimen and malt liquor in inducing an aggravated attack:—That Miss A.'s case differed in so many important particulars from the general course of the disease, and more especially in its frequent recurrence and unusual obstinacy, that I must necessarily infer a cause somewhat different or more complicated:—And that I considered a torpid and

obstructed state of the liver as the probable source of the anomalous facts of the case, and as furnishing the best explanation of the partial success of the plan adopted. I therefore advised, that, should the moderate system of purging persevered in for a week, ten days, or more, fail of establishing her convalescence, the pills already directed should be substituted for the calomel and jalap, conjoining therewith the free use of the warm bath and of nitrous acid; and also, that, if purging alone should once more remove the complaint, it would be advisable to administer those pills for some time after, to prevent a recurrence of the disease.

To this detail I have nothing further at present to add, than that I subsequently ascertained, from a near relative, that Miss A. perfectly recovered, but under what circumstances, or after what length of time, he could not inform me. Her residence in England precluded me from obtaining more particular information.

Before I enter on the third case, in which blood-letting as well as mercurial purgatives was required, I will first concisely state the outline of the first two cases of *purpura hæmorrhagica*, in which I found it necessary to bleed in order to perfect the cure. Both occurred in the King's Hospital, and in the same year, 1817. In the summer of that year one of the boys, thirteen years old, was seized with epistaxis, more severe than boys are generally liable to, and complained of headach. On examining his skin, spots of a vivid red were visible on the trunk and extremities, resembling petechiæ in every thing but the colour. As he was a boy of a full habit, and as his pulse was full and firm, though not much quicker than the natural standard, I should have bled him at once, and without hesitation, but that I was desirous first to try the effect of purgatives in subduing a form of the disease, in which (if in any) venesection was obviously admissible. In a few days the spots altogether disappeared under mercurial purgatives, and the epistaxis ceased. After a little time, however, the epistaxis occasionally recurred, the pulse being full, and the skin rather hot; and though I resumed the purgatives, I found it necessary to bleed him to ℥viii . before the tendency to hemorrhage could be permanently subdued. In this case there was none of that languor, and but little of the epigastric tenderness usual in purpura; the fæces, however, were dark, and the urine high-coloured.

The next instance occurred in the winter of the same year, in the daughter of the chaplain's servant, a girl fourteen years of age, who had not yet begun to menstruate, but was apparently in good health. The disease commenced with severe pains of the knees, succeeded by an extensive eruption of red spots and vibi-

ces on the lower extremities, becoming purple ere they disappeared. The tongue was white, and skin hot, with much thirst; the pulse quick and full, with occasional hemorrhage from the nose, at times profuse. There was headach with a sense of fulness. The abdomen was large, with fulness of the epigastric and right hypochondriac regions, and pain on pressure. The urine was high-coloured and loaded. The eruption disappeared altogether in four days under active purging,—the pains of knees, heat of skin, and full quick pulse, with occasional epistaxis, continuing. To remove these, it was necessary to bleed twice to $\frac{3}{4}$ viii. each time, * and to persevere in mercurial purgatives. The alvine discharges were first whitish, then dark, then highly bilious, then of mixed colours, and finally natural. The general health was fully reestablished in less than a fortnight, and ere convalescence was decided, the gums were slightly affected by the mercury. In both these cases, but for my wish first to try the effect of purgatives, I should, without the least hesitation, at once have had recourse to venesection, the indications being obvious. In the boy the existence of abdominal congestion was not very evident; in the girl it could not be overlooked. His was almost a pure case of plethora, and required venesection; whereas the affection in her, might in my mind have been as efficaciously, if not as expeditiously, combated by the *immediate* application of leeches to the right hypochondrium, followed by mercurial purgatives in quick succession, till the gums were smartly affected. In both, the influence of purging in removing the spots was rapid and unequivocal.

CASE III.—Thomas Tyrrell, aged 20, was admitted into the Whitworth Hospital, on the 7th Oct. 1825, having about a fortnight before complained of general uneasiness and pains of back and limbs, and about six days since, of headach, vertigo, rigors, vomiting and thirst. Though he had taken several purgatives with good effect, there was now tenderness of belly on pressure; skin hot and dry; tongue loaded, moist, and white; eyes injected; pulse 80; gums sore, as if from mercury; two dark stools. Six leeches were ordered to each temple, and blue pill and aloes directed every third hour. On the 8th, the pulse was 96; skin warm; tongue cleaning; countenance improved, and bowels free, with some tenesmus. Blue pill, ipecacuanha, and opium were ordered, with a rhubarb draught in the morning. From the 9th to the 16th, he continued with little alteration, still taking alterative aperients.

* I do not find it noted whether the blood drawn in these instances had any, and what peculiar appearance, and at this distance of time I cannot undertake to charge my memory with any distinct recollection thereof. My impression is, that the crassamentum was very firm, but that there was no appearance of buff on the blood.

On the 16th, he complained of pain of belly, which was soft ; and he had two stools ; but without *fæculent* matter. He was ordered an oily draught with tincture of jalap.—On the 17th, the bowels were freely moved ; the skin was cool ; the tongue clean ; the pulse 100, and feeble. He was ordered infusion of bark, with sulphuric acid and a little red wine, every eighth hour.—On the 18th, the pulse was 88 ; with pains in knees, wrists, and back. He was ordered fifteen grains of Dover's powder.—On the 19th, the tongue was foul, brown, and mottled ; there was tenderness of epigastrium, and very dark stools ; and the eyes were injected. He was ordered twelve leeches to the epigastrium ; $2\frac{1}{2}$ grains of calomel, with $\frac{1}{4}$ grain of opium, every third hour ; an enema in the evening, and a rhubarb draught in the morning.—On the 20th, the stools were bloody ; the hands *œdematous* ; the extremities covered with *petechiæ* ; the abdomen painful on pressure ; the pulse very feeble ; and countenance sunk. The same pills were repeated, and a draught of castor oil, spirits of turpentine, and infusion of senna, directed for the morning.

On the 21st, I visited him with Dr Morgan, and continued to make occasional visits by Dr Morgan's permission, till the termination of his complaint. On this day, the mucous membrane of the nose was bloody, and the gums of a deep blood-red colour ; the pulse was 104, and firm ; the stools *fæcal*, of various colours, streaked with blood ; the tongue foul ; and severe colicky pains were complained of. An emollient enema was ordered immediately, and the pills and rhubarb draughts repeated. During the day, the *petechiæ* continued to increase in size and number on the legs, feet, gums, and lips ; there were five stools, bloody, and of various colours ; also some vomiting.

On the 22d, he complained much of his belly, and of general soreness ; the *petechiæ* were much increased on the nose and ears ; the tongue was loaded, white, and dry ; the pulse 96 ; the skin ardent ; the stools copious, of various colours, and bloody. He was ordered twelve leeches to the epigastrium ; an emollient enema, and the rhubarb draught, with 3 grains of blue pill, $1\frac{1}{2}$ of calomel, and 5 of colocynth pill every third hour.

On the 23d, the pulse was 104, the skin hot, and tongue foul ; the spots were enlarged on the extremities, and florid ; the largest dark ; the stomach was irritable, with pain in the belly, which was relieved by lying on it ; there were six copious, *fæcal*, and variously coloured stools ; the *œdema* of the hands was less, and there was none on the feet. He was ordered a purging enema immediately ; blood-letting to twelve ounces ; and the same pills. The blood was neither buffed nor cupped, nor did it present any remarkable appearance.

On the 24th, Three scanty slate-coloured stools ; pulse 100 ;

petechiæ less distinct; mucous membrane of nose still bloody; pain of belly less; no œdema of either hands or feet; gums natural in colour. He was ordered two grains of calomel and five of colocynth pill every second hour till the bowels were freely moved; a purging enema in the evening; also some light broth.

On the 25th, Pulse 104; skin warm; tongue not foul; stools dark; membrane of the nose more healthy; abdomen very tender on pressure; petechiæ on the feet more numerous but florid; face flushed; some greenish fluid vomited. He was ordered fifteen leeches to the belly; five grains of blue pill and two of dried soda every third hour, and after each dose, a purging draught till the bowels should be freely moved; also an enema in the evening. The draughts, however, were rejected, and ten grains of colocynth pill, with $1\frac{1}{2}$ grain of gamboge every second hour, were therefore substituted.

On the 26th, Pulse 120; skin hot; belly very painful; stools dark brown; vomiting; epistaxis; pains in fingers; petechiæ increased, chiefly about the knees and elbows. He was ordered blood-letting to twelve ounces; five grains of colocynth and blue pill, with one of gamboge every second hour till the bowels were freely moved. The blood was not buffed; crassamentum not firm.

On the 27th, He was relieved by the blood-letting; the abdomen bears pressure; petechiæ on the increase, occupying chiefly the roots of the hair; face pale; skin cold; pulse 112 and feeble; stools copious, of various colours, with some blood and tenesmus. He was ordered an oily draught, with some tincture of opium every sixth hour.

On the 28th, Pulse 108; tongue coated; petechiæ much more abundant, of a pure colour; stools copious and more natural; no blood to-day, but much mucus and blood passed yesterday by stool; pain of epigastrium. He was ordered the same oily draught with some tincture of rhubarb.

On the 29th, Pulse 104; belly free from pain; tongue loaded, brown and spotted; stools copious and highly bilious; petechiæ florid, increased in number and size, but diminished on upper extremities; skin over part of the toes raised by ecchymosis; appetite keen. He was ordered 4 grains of blue pill, with 2 of Dover's powder every third hour, and an oily draught in the morning.

On the 30th, Pulse 100; tongue clean; skin hot; much pain in knees and wrists; but neither œdema nor redness; a hard green ball of fæces passed in the night; petechiæ diminishing; nose less red. He was ordered the same pills, with

the draught, and a warm bath in the evening. Abdomen painful towards night.

On the 31st, Pulse 116; skin cool; tongue foul; stools copious and more natural; petechiæ disappearing rapidly; complains much of pain on the outside of each knee, increased on pressure. He was ordered the same pills and warm bath, with the oily anodyne draught.

Nov. 1st, Five large natural stools; tongue clean; skin warm; pulse 96; improving in every respect. The treatment was directed to be continued.

On the 2d, Stools copious and natural; no complaint of any kind. All medicines omitted.

In the interval between the 2d and the 6th, the stools assumed a pale colour, for which reason the blue pill with colocynth was resumed; and on the 6th, there was œdema of the feet, with petechiæ appearing thickly on them; pulse 96; tongue clean; stools of various colours. He was ordered 6 grains of calomel, and a rhubarb draught in the morning.

On the 7th, The petechiæ were less; the stools copious, and of various colours and consistence, with some spots of blood; face pale and leucophlegmatic; pulse 80; feet less œdematous; the petechiæ and œdema disappeared in a few days, the stools being still unhealthy in colour; yet the health gradually improving under mild alterative aperients.

On the 15th, The report is, that the feet swell on sitting up; the stools copious, uniform, but of too light a colour. He was ordered blue pill with aloes, and an infusion of bark with sulphuric acid.

On the 17th, The report is, that he had passed the first natural stool since his admission, and that his health was much improved from this date to the 24th. After this no report appears in the books. Mercurial alteratives were still continued in consequence of the occasional recurrence of unnatural faecal discharges, though his general health continued steadily to improve, so that he was dismissed cured before the end of the month.

It is further noted by Dr Morgan, that, about two years subsequently, this patient was again received into the Hospital with many symptoms which seemed to threaten a second similar attack, though no petechiæ appeared. These symptoms, however, yielded to purgatives.

This case is remarkable in many of its features. 1st, For the long duration of acute illness before the appearance of the petechiæ; 2dly, for the obvious connection between the petechiæ and a diseased state of the intestinal canal and liver, so strongly marked by the recurrence of the one on the revival of

the other ; *3dly*, for the long duration of the whole disease, and the obstinacy with which it resisted remedial means of obvious propriety, and of such active character. The case is also remarkable for the cedematous swellings which accompanied it, and which closely resembled and strikingly illustrate the swellings that attended Miss A.'s complaint, though their suddenness in the latter would appear to constitute a great if not an essential difference.* In both instances I consider them connected with obstinate hepatic obstruction, and in both they yielded through the active intervention of mercurials, though these did not excite pyalism. Had the mercurial action been more fully and easily produced in both, it is my present impression, that the complaint would not have been so tedious. Tyrrell's case is further remarkable; as exhibiting a mixed or middle character between the inflammatory purpura and that which readily yields to purgatives alone. Though not of very decided inflammatory aspect, it required blood-letting for the relief of urgent symptoms, and admitted of the operation much better than ordinary cases ; † while at the same time the purgative and mercurial plan seemed essential to a perfect cure. The florid appearance of the petechiæ in this case, as in the two instances in which I found venesection so necessary, would seem to indicate that this colour is in some degree characteristic of the species of purpura which admits of blood-letting ; the great difference between these cases consisting in the greater strength and firmness of pulse in the latter, and the more plethoric or inflammatory state of the system. †

* I have under my care at this moment a young lady labouring under considerable hepatic disease, and who has been an invalid for several years, in whom swellings of an inflammatory character have occasionally seized the fleshy part of the arm and calf of the leg so suddenly, as almost to be visible in their growth ; a phenomenon which, I must confess, I do not comprehend.

† Many instances might be adduced to show not merely the pernicious influence of blood-letting in the ordinary cases of purpura, but also the difficulty of taking blood, even to a very small amount, without producing alarming syncope. Besides the many cases on record of this description, a medical friend, now no more, with whom I frequently corresponded, mentions in one of his letters : " I have cured several cases of purpura hæmorrhagica by purging ; one lately (in 1818) of the worst description, by it alone. The whole body was covered with large purple blotches, and the tongue and gums with large, spongy, protuberant, dark-purple excrescences. The disease was sudden in its appearance, and, as the subject (an adult man) was of full habit, I tried the effect of blood-letting before I purged him. The loss of one ounce produced immediate syncope. Purges of calomel, jalap, and scammony, every second day, removed the disease in about a fortnight."

‡ The editor of the *Medico-Chirurgical Journal*, in a note to a case of purpura hæmorrhagica, recorded in that Journal for May 1828, has very judiciously remarked, relative to the tongue appearing like a " large black bleeding fungus," that these appearances are produced by the coagulable lymph of the blood that has oozed from the vessels and formed itself into crusts which tenaciously adhere to the parts. These phenomena, the editor observes, always indicate an inflammatory diathesis and sizy blood ; and, whenever they present themselves, venesection may be safely employed. It is clear, however, that there are cases requiring venesection, in which

This subject, however, I propose to resume and to discuss with more satisfaction, and upon better data, when executing the other more important portion of my task,—that of bringing together in a tabular form the several authentic cases on record; and, after due analysis and comparison, endeavouring to fix the characters, causes, and mode of treatment peculiar to the several varieties of purpura.

5, Grenville Street, April 1830.

(*To be continued.*)

ART IV.—*An Answer to some Objections proposed by Xavier Bichat against the opinions of Goodwyn, respecting the cause of the cessation of the action of the Heart in Asphyxia from Suffocation.* By the late EDMUND GOODWYN, M. D. Communicated by Dr BOSTOCK.

[The following paper has been transmitted by Dr Bostock, with the information that the author refrained from publishing it himself during his lifetime, on account of his dislike to controversial discussions, but desired that after his death his friend Dr Bostock might publish it if he thought this advisable. Although the work which is criticized has been very long before the public, we think that Dr Goodwyn's friends, and physiologists generally, will be well pleased to see what views the ingenious author entertained of Bichat's researches, especially where they differed in their results from his own.]

THE authority of Bichat on subjects in physiology has now obtained such general currency, that it will almost savour of heresy in the present times to attempt to controvert his opinions. His minute acquaintance with anatomy,—his remarkable dexterity in making experiments,—his ingenuity in varying them,—and his apparent candour in forming his conclusions, have altogether given to his opinions on these subjects an extent of circulation and favour greater than to any other writer throughout Europe; yet to persons practically accustomed to inquiries of this kind, many and great defects will be found in the works of this popular author. His plans of investigation are quite irregular, and seldom strictly analytical,—his experiments themselves are often so complicated that no safe conclusion can be deduced from them,—and his language is sometimes so obscure or metaphorical, as to be unfit for the precision of science. Under such imputations, any attempt to examine into the sources of the opinions of this author is entitled to a candid reception, and in this persuasion the present writer is induced to offer to his professional readers the following strictures.

In the second part of the *Recherches Physiologiques sur la*

these appearances are not to be found; and the same may be said of the florid or vivid colour of the spots.

Vie et la Mort, at the sixth article, Bichat undertakes to determine the influence which the death of the lungs exerts upon the death of the heart,—a subject which has engaged the attention of physiologists from the earliest periods, and produced successively a variety of ingenious and conflicting opinions. These opinions, however respectable their authority, Mr Bichat has not noticed ; but he appears to have arrested his attention principally on the work of a modern author, who preceded him only a few years in the same inquiry, and whose experiments and opinions had obtained some consideration in the schools of medicine. *

On entering upon the solution of this difficult problem, Bichat adopts the usual order of investigation traced by others : treating, first, on the mechanical changes produced on the vessels of the lungs in the different stages of respiration ; then on the chemical changes produced on the blood circulating through these vessels ; and, finally, on the influence of these changes on the action of the heart itself.

The first division of his subject Bichat passes over without discussion, admitting the correctness of Goodwyn's general conclusion—"That after expiration the air remaining in the air-vesicles of the lungs distends them sufficiently to permit the blood to circulate freely through them,"—and adding afterwards some additional facts, to strengthen and confirm the truth of this conclusion.

The second or chemical division engages his whole attention. He sets out with at once opposing Goodwyn's main conclusion, respecting the particular influence of the circulating blood upon the left auricle and ventricle of the heart ; and in its stead proposing an opinion of his own, which he afterwards labours to establish with all the resources of his active and acute mind.

According to Goodwyn, (says Bichat,) the sole cause of the cessation of the contractions of the heart, when the chemical phenomena are interrupted, is the defect of excitation of the left or systemic ventricle, which does not find in the black blood a sufficient stimulus ; so that in his manner of considering asphyxia, death follows on these occasions solely, because that cavity, the left ventricle, can no longer transmit the blood to the different organs. It comes on almost in the same manner as from a wound in the left ventricle, or rather when a ligature is made of the aorta as it comes out from the pericardium :—Its principle, its source, is exclusively in the heart. The other parts of the body die because they receive no blood, almost like what happens in a machine, when we stop the principal spring : All

* The Connection of Life with Respiration. By Edmund Goodwyn, 1788.

the others cease to act, not from themselves, but because they are not put into action. "But (he adds) on the contrary, I believe that in the interruption of the chemical phenomena of the lungs, there is a general affection of all parts of the body,—that the black blood pushed forwards in all directions, carries weakness and death to each organ with which it comes in contact,—that it is not because they do not receive blood, but because they do not receive *red* blood, that each of the organs of the body ceases to act;—in short, all of them are penetrated with the immediate cause of their death in such a manner as I shall afterwards show."—"I shall first, however, limit myself to the inquiry into the phenomena arising from the contact of black blood upon the inner surface of the heart."

The contractions of the heart, he continues, may be weakened, or may cease from the influence of the black blood in two ways;—*first*, as Goodwyn has said, because the left ventricle is not excited by this black blood on its internal surface;—*secondly*, because this black blood, carried by the coronary arteries into the substance of the heart, hinders the action of its fibres, and acts upon them as it does upon all other parts of the animal economy, by weakening their force and activity; "but I believe that the black blood *does*, like the red, produce on the internal surface of the aortic ventricle an excitation which forces it to contract; and the following observations seem to confirm this assertion."

"If the asphyxia from suffocation had the influence on the functions of the heart described by Goodwyn, it is evident that its phenomena should begin by the cessation of the action of this organ, and that the extinction of the cerebral functions should be only secondary, as happens in cases of syncope, where the pulse is suspended instantly, and by that suspension the action of the brain is suspended also. Yet, if you produce an asphyxia in an animal by closing the trachea, by placing the animal in a vacuum, or by opening the chest, &c. you will constantly observe that the sensations, the perceptions, the voluntary motions, and the voice are first suspended; that the animal becomes dead externally, but that internally the heart beats some time, and the pulse keeps up; in such examples, it appears that the heart and the brain do not stop at the same time, as happens in syncope, but that there are violent commotions, and the heart survives the brain some minutes." "And hence, Bichat adds, the different organs do not cease to act in asphyxia, because the heart sends them no blood, but because the blood which it sends to them is not such as they have been accustomed to."—*Recherches Physiologiques*, p. 199.

This objection, it may be said with confidence, is founded

entirely on a misstatement of facts. In Goodwyn's description of the character and progress of the asphyxia from suffocation, he does not state that the phenomena should begin by the cessation of the action of the heart, as Bichat asserts;* on the contrary, he shows distinctly that the phenomena should terminate by the cessation of the action of this organ, and when this action has ceased, that then the cerebral functions should be suspended also; that between the beginning or first symptoms and this termination, there should be an interval, generally of more than a minute, during which there is a progressive and corresponding derangement of the contractions of the heart, and of the cerebral functions, until their entire cessation, which appears to take place in both at the same instant.† It is not, therefore, true, as Bichat has asserted here, that, according to Goodwyn, in the asphyxia from suffocation, the phenomena should begin with the cessation of the action of the heart, nor is it correct that the sensations and voluntary motions should be first suspended in this disease; the changes produced on the action of the heart, and on the influence of the brain, should be simultaneous, and the observation of others show that they are so.

Bichat next undertakes to prove, by direct experiment, that the black blood does actually excite the left ventricle of the heart to contraction, when applied to its internal surface. In his first experiment, he exposed to view and divided the trunk of a large artery of a living animal, and then closed the trachea; when this was done, the blood which flowed from the artery became gradually darker, until it was as black as venous blood, yet during the change of colour, and for some time after, this blood continued to spring from the divided artery with a force equal to that which takes place when the blood issuing from an artery is red.

In another living animal he divided the artery in the same manner, and exhausted the air from the lungs with a syringe, and then closed the trachea; the black blood flowed from the divided artery, and succeeded the *red* much sooner than in the preceding case, and without passing through the different shades of dark; yet Bichat adds, even this black blood sprung from the artery in a strong stream for some time.

His other experiments consist in injecting the black blood of one animal into the pulmonary veins of another animal, in which the contractions of the heart had been previously weakened by an artificial collapse of the lungs on one side of the chest. In these cases, he says, the black blood injected did not appear to

* See Connection of Life with Respiration, page 88.

† Ibid. p. 3.

diminish the contractions of the heart, but rather to increase them, when the piston of the syringe was pressed down. And as a further additional proof, he adds, that when an animal has been killed by an injury of the brain or of the lungs, as long as the heart retains its irritability, he can restore its contractions by injecting hydrogen gas or carbonic acid gas into the pulmonary veins; and he says, it has even happened to him to re-establish the contractions of the heart, when they have been destroyed (anéanties) by different kinds of violent death, only by the contact of black blood injected through the pulmonary veins into the left auricle and ventricle."

Respecting the two first of these experiments, the description which Bichat has given of the effects of the black blood on the heart and arteries, is directly opposed to what has been observed in similar experiments by other writers, and particularly in that fine experiment first described by Vesalius, and now so generally known and so often repeated; where, by the removal of the sternum, the lungs are fully exposed to view, and then inflated and depressed alternately, as in natural respiration, whilst at the same time the circulation of the blood from the lungs to the heart is distinctly seen; as soon as the lungs are inflated, the blood which passes through the pulmonary veins to the left auricle and ventricle is florid, but when the inflation is suspended, this blood in the pulmonary veins is seen to become at first brown, and then black, like venous blood; and in these cases the uniform testimony of observers is, that as soon as this blood assumes a shade of brown, the contractions of the left auricle and ventricle are weakened, and that this weakness increases as the colour of the blood becomes darker; and when it is black, or like venous blood, the contractions of the left auricle and ventricle cease;—in the whole of this process, the force of the blood flowing from the arteries must of course correspond with the force of the contractions by which it is expelled from the heart: And this seems to prove distinctly, in opposition to Bichat's statement, that the blood when black or venous, does not excite the left ventricle of the heart to contraction when applied to its internal surface. In such a disagreement of evidence, an impartial inquirer will be disposed to admit the superior weight of numerical authority, although it should impeach the accuracy of this distinguished anatomist.

His remaining experiments are too complicated to lead to any satisfactory conclusions: When the black blood is injected into the pulmonary veins on one side of the lungs, whilst the red blood continues to flow through the pulmonary veins on the other side, the colour of this mixed blood, as it is received into the left auricle and ventricle, is not entirely black, but partly

black and partly red. Under such circumstances, it is not possible to determine whether the portion of black blood in mixture with the red has any direct influence in exciting the contractions of the left auricle and ventricle. And further, this black blood being injected into the pulmonary veins from a syringe, it passes thus into the left auricle and ventricle in a quantity and with a momentum different from that which takes place in the ordinary circulation. These two circumstances alone will account for the temporary increase or the revival of the contractions of the heart in the above-mentioned experiments, independent of the quality of the blood which passes into it: as we know, by many familiar facts, that several other fluids of the mildest kind, and even hydrogen gas injected into the hearts of frogs and toads, when separated from their bodies, will renew or increase their contractions for a few seconds, merely by the unusual distension these fluids occasion. The same principle will also account for the renewal of the action of the heart, by injecting black blood into its cavities, when this action has been suspended* by a violent death, without having recourse, in these cases, to the supposition of a stimulating quality in this blood.

Although Bichat appears to think he has proved by the preceding experiments, that the black blood does actually excite the left auricle and ventricle to contraction, by its simple contact with their internal surface, he still admits the fact, that in the asphyxia from suffocation, these contractions are made to cease, in consequence of the stream of this black blood flowing into the cavities of this auricle and ventricle; but this cessation, he says, is then produced by the contact of this black blood with the muscular fibres of the heart; it is carried to these fibres by the coronary arteries, and penetrates the texture of these fibres, and thus weakens them, and makes them unfit for contraction. Respecting the manner in which this black blood exerts its influence on the muscular fibres of the heart, whether through the medium of the nerves or otherwise, he does not pretend to determine. But, from the preceding experiments, he thinks himself entitled to establish this general conclusion,—“That the heart ceases to contract when the chemical phenomena of the lungs are interrupted, because the

* Bichat employs the word *anéanties* here, a term that seems to express in the English language *destroyed*, which cannot be a true description of the state of these cavities, as he says the contractions were renewed again by this black blood after their destruction, which I believe is impossible; I have therefore ventured to substitute the word *suspended* in the place of it, both as describing the true state of the heart in these cases, and also as allowing to Bichat's argument the greatest possible advantage.

black blood which penetrates its fleshy fibres is not fitted to keep up their contractions."

To this conclusion there is one strong objection, which Bichat states very fairly himself, and endeavours to grapple with in his usual confidence.

As the black blood is distributed in equal proportions on the fleshy fibres of the whole heart, by means of the coronary arteries, the influence of this blood should be extended equally to both sides of this organ; and if Bichat's conclusion be correct, both sides should cease to contract at the same time. Yet he admits, that in these cases of asphyxia the left auricle and ventricle always cease to contract the first, and the right cease some time afterwards. Still he contends these two facts afford no proof that the weakness produced is greater, or the death sooner, on one side of the heart than on the other, because the same order and succession of cessation takes place in death with all the warm-blooded animals, from whatever cause it may arise; a mode of reasoning which is contrary to all sound philosophy; as it supposes for this particular case a suspension of the operation of an intelligible cause and effect, in favour of an assumed general law not at present understood.

"If, says Bichat, the left ventricle died first, as the theory of Goodwyn supposes, the following appearances should be observed on opening the bodies of asphyxiated persons:—

1st, Distension of the left auricle and ventricle with black blood, which they are not able to throw out into the aorta.

2dly, Equal distension of the pulmonary veins, and of the lungs themselves.

3dly, Consequent plenitude of the pulmonary artery, and of the right auricle and ventricle."

In these cases, he continues, the congestion of the blood ought to begin in that particular *reservoir*, which ceases to contract the first, and from thence to extend backwards to those which cease the last; whereas, on opening the bodies of asphyxiated animals, we observe appearances entirely different.

1st, The left auricle and ventricle, and the pulmonary veins, contain only a very small quantity of venous blood, compared with the quantity which distends the right auricle, and ventricle, and pulmonary artery. *

2dly, The point where the blood stops is principally in the lungs, and from thence the stagnation extends to the whole venous system.

* This statement is not correct. The left auricle and ventricle of asphyxiated animals are generally found to contain about half the quantity of blood observed in the right.—See Coleman on Suspended Respiration, p. 248; and Goodwyn's Connection, p. 5.

3dly, The arteries contain as great a proportion of black blood as the ventricle which corresponds to them.

These facts and deductions were stated and urged with considerable success, as objections to Goodwyn's theory, by an ingenious writer on this subject,* some time before Bichat's work appeared; but subsequent observations and experiments have proved, that the premises from which these deductions were made are not true, as we shall now endeavour to show.

It is clear that Bichat must have formed the deductions above cited, on the supposition that the pulmonary circulation is carried on upon the same principle as the motion of fluids in a hydraulic machine; that the arteries and veins of the lungs are passive tubes; that the blood which flows through them derives its momentum solely from the impulse it receives on leaving the right ventricle to enter into these tubes, and from them it passes on into the left auricle and ventricle, as into reservoirs † adapted to receive it. If it were so, then indeed his deductions would be right, for as on Goodwyn's theory, the left auricle and ventricle cease to contract *first*, the congestion of the blood ought to *begin* in these two *reservoirs*, and from them to extend backwards to the pulmonary vessels, and to those cavities which cease to contract the last, as Bichat has stated.

But the circulation of the blood is carried on upon principles entirely different from those of a hydraulic machine, as has been stated by our latest distinguished physiologists. ‡ It has been demonstrated by experiment, that the arteries possess a proper contractile power, the same as the fibres of the muscles; and that they are excited to action by their appropriate stimulus, like the fibres of the muscles; and further, that this contractile power is seated principally in the capillaries, while the veins and the large trunks of the arteries possess it only in a small degree. Instead, therefore, of regarding the pulmonary vessels

* See Coleman on Suspended Respiration, page 99.

This writer also proposed another objection in the same work against the hypothesis of Goodwyn, deduced from the peculiarity of the circulation of the fœtus; where he says, the blood which passes to the left auricle and ventricle is darker than that which passes to the right auricle and ventricle: but in this assertion Mr Coleman appears to have been in an error; for it is demonstrated that a part of the florid or maternal blood, which comes to the fœtus by the umbilical chord, passes directly into the right auricle, and from thence through the foramen ovale into the left auricle and ventricle, where it mixes with the black blood received from other sources; and although by this admixture this florid blood is much diluted, yet it is not so dark as the blood in the right ventricle, and it is necessary to keep up the contractions of the left ventricle, because if this small supply of florid blood is intercepted by a pressure on the umbilical chord, this ventricle ceases to contract.

† The term used by Bichat himself.

‡ See Bostock's Elementary System of Physiology, Vol. i. page 401.

as passive tubes, we must consider them as vital organs, acting under the influence of their appropriate stimuli.

It has been also shown by experiments equally correct, that the heart possesses a power of dilating itself independent of the current of blood which passes into it from the veins, and that in this act of dilatation the blood coming to it from the veins is drawn forwards into its cavity, upon the ordinary principle of suction, and that the force of this dilatation in each auricle and ventricle is always in proportion to their preceding contraction,* —qualities to which the term reservoir cannot apply.

From these facts it is clear that the circulation of the blood through the lungs is effected by the combined action of both sides of the heart, and the pulmonary vessels also. Besides the impulse which the blood receives in coming from the right ventricle of the heart, it is also urged forwards by the pulmonary vessels themselves, as it passes through them, and particularly by the arterial capillaries; and it is further assisted onwards by the diastole of the left auricle and ventricle, which action it has been shown draws the stream of blood towards them.

Let us now assume these facts as admitted, and next inquire what ought to take place in the distribution of the pulmonary blood, on the hypothesis of Goodwyn, "that the left heart dies first in the asphyxia from submersion."

When an animal is first immersed in water, the cavity of the lungs contains a considerable quantity of atmospheric air. This

* This important faculty of the heart was, I believe, first attempted to be demonstrated in an Inaugural Dissertation, printed in Edinburgh, in the year 1782, by J. T. Vander Kemp, and his opinion has since found able defenders in Drs Wilson and Carson, who have contributed by additional arguments and facts to establish it more firmly. As this Inaugural Dissertation must now be very scarce, I shall transcribe the passage relating to this subject, in order to do justice to the author.

"It may appear singular that I should regard the diastole of the heart and of the arteries as among the causes that move the blood forward; since it is generally admitted as common doctrine, that the heart, reluctant to dilate, or at most remaining passive, is opened and filled solely by the impulse of the blood flowing into it. But when I see the hearts of a frog or an eel separated from the bodies of these respective animals, and entirely deprived of their blood, yet still contracting, and after every systole, still restoring themselves to their former state by a complete diastole; and when I consider further that every muscular fibre, after contraction and the removal of the stimulus which occasioned the contraction, returns by its own inherent virtue, to the same state it was in before it contracted; and moreover, when I observe in the dead body, that the heart is flaccid, and its auricles without their vital turgescence and collapsed; and when I observe further, that the *vis a tergo* of the arterial blood is not sufficient to account for the progressive motion of the venous blood, I am driven to the conclusion, that the heart dilates itself by the peculiarity of its own structure, and in this dilatation it draws the blood into it, with a force equal to that with which the blood had been just before expelled from it, and that the flowing of the blood into the ventricle is not the cause of the diastole, but, on the contrary, the diastole is the cause of the passing of the blood into the ventricles, just in the same manner as the expansion of the thorax is the cause of the rushing of the air into the lungs, and not the effect.—*Dissertatio Medica de Vita et vivificatione Corporis humani*, &c. p. 52.

quantity varies in different individuals, and in the different circumstances of immersion; but in most cases there is enough to supply a portion of oxygen or colouring principle to the blood, as it passes through the pulmonary vessels for a short time, generally about a minute and a-half or two minutes, when the asphyxia is complete. The quantity of this supply must of course now be less than what is usually furnished by the successive renewal of atmospheric air in ordinary respiration, and the change of colour from dark to florid in the pulmonary blood must be also in the same diminished proportion until its entire cessation.* It should be remembered here, that, on the hypothesis of Goodwyn, it is by this change of colour which the blood undergoes in passing through the lungs, that it is fitted to excite the pulmonary vessels and the left auricle and ventricle of the heart to contraction. Now, as this change of colour begins to diminish in a few seconds after immersion, † the contractions of the pulmonary capillaries, where it principally takes place, will also begin to be weaker; and the blood passing through them will be propelled forwards towards the left auricle and ventricle with less force, and in diminished quantity, until at the end of a minute and a-half or two minutes, when the change of colour no longer takes place, these vessels will then cease to contract entirely, and the black blood in them will remain at rest and stagnate. About the same time effects nearly correspondent must be produced on the left auricle and ventricle. The dark blood which they now receive from the pulmonary veins being less fitted to keep up their action than before, their systole and diastole will become weaker in proportion as the blood becomes more dark; and, as soon as it becomes black, this auricle and ventricle will cease entirely to contract and dilate; and, as the dilatation is the last act of the ventricle before it reposes, some black blood must remain in its cavity at the time of cessation. But as the stream of blood which came to this auricle and ventricle before they ceased to act was progressively diminished in quantity, and

* That the volume of air which remains in the lungs after immersion does continue to impart its oxygen to the pulmonary blood, has been shown by satisfactory evidence. Mr Berger of Geneva collected and analyzed a portion of this air when expelled from the lungs a short time after immersion, in a great variety of different animals, and he uniformly found that it had lost nearly the whole of its oxygen.—*Essai Physiologique sur la Cause de L'Asphyxie par submersion*. Par J. F. Berger, de Geneve, 1805.—And that the pulmonary blood continues to receive some florid colour from this air after immersion, for a short time, has been proved by Bichat himself, particularly in the experiment of removing the sternum and inflating the lungs. “At the end of thirty seconds after inspiration,” he observes, “the blood going through the pulmonary veins to the left auricle and ventricle becomes a little dark; at the end of a minute it is still darker; and at the end of a minute and a-half or two minutes, it is quite black or venous.—*Recherches Physiologiques*, p. 88.

† According to Bichat in thirty seconds.—*Rech. Physiologiques*, p. 88.

the force of their dilatation also became progressively weaker, the quantity of black blood received into their cavity at their last dilatation ought to be much less than the quantity they usually receive in the ordinary circumstances of respiration. Whilst these changes are going on about the left side of the heart, the right side is regularly supplied with its accustomed blood from the trunks of the two *venæ cavæ*, and this auricle and ventricle will continue to contract and dilate, and to propel their blood into the pulmonary arteries with their usual force ; but the current of this blood will meet with resistance in the capillaries of these arteries from the previous stagnation of the blood in them, already described ; and this resistance will soon occasion a complete obstruction to its course, which will extend backwards to the trunks as they issue from this ventricle, and will oppose the same resistance to the issue of blood from the ventricle itself, which of course becomes now in its turn distended and gorged with blood. But, as this blood is the same which usually excites the right ventricle to contraction, it continues to make strong and ineffectual contractions some time after the left auricle and ventricle have ceased to move ; and thus, although the heart dies first in this species of asphyxia, still, on the hypothesis of Goodwyn, the left auricle and ventricle, and the pulmonary veins, ought not to be distended with black blood, as Bichat and Coleman have supposed, but, on the contrary, they ought to contain a much less quantity of blood than the right auricle and ventricle and the pulmonary arteries ; and the point where this blood should begin to stagnate ought to be principally in the capillary arteries of the lungs, and from thence the stagnation should extend backwards to the right auricle and ventricle ; and this agrees precisely with the appearances which these two writers acknowledge to have observed in the pulmonary blood of asphyxiated animals. Instead, therefore, of furnishing an objection to the hypothesis of Goodwyn, this distribution of the pulmonary blood should be considered as affording it additional strength and confirmation.

Having now endeavoured to answer the principal arguments brought by Bichat against the hypothesis of Goodwyn respecting the cause of the cessation of the contractions of the heart in the asphyxia from submersion, I may be allowed to state a very important objection against the theory which Bichat himself has proposed on this subject,* and which he has not been able to answer in a satisfactory manner.

If it be true, as Bichat asserts, that the left auricle and ventricle cease to contract in asphyxia from suffocation, because the

* See page 76.

black blood carried by the coronary arteries to the muscular fibres of the heart penetrates and weakens these fibres, and thus renders them unable to contract, it should follow, that, in order to renew these contractions again, some florid blood must be sent into these arteries to restore the lost strength of these muscular fibres, and thus to enable them to contract again ; but the only means we have of sending florid blood into these coronary arteries is by the contraction of the left ventricle, which, on Bichat's hypothesis, is now not able to contract ; and hence it must appear, that, when the contractions* of the left auricle and ventricle have ceased in the asphyxia from suffocation, it will be impossible to renew them again. Yet there are numerous instances of the contractions of the left auricle and ventricle being renewed after they have ceased to contract for several minutes, and solely by the application of florid blood to their internal surface, particularly in the cases of asphyxia from drowning, and still more in that striking experiment of removing the sternum and inflating the lungs, as before described. In this case the contractions of the left auricle and ventricle are seen to cease when the blood which flows to them becomes black, and to be renewed again instantly when the blood which flows to them becomes even slightly florid. Bichat appears to have repeated this experiment himself often, and to have noted distinctly the effects of the different changes of the pulmonary blood upon the left auricle and ventricle ; but he evades the force of these facts, as objections to his theory, with a dexterity and address hardly consistent with candour. The florid blood, he says, in this experiment penetrates the fibres of the heart, and removes the weakness occasioned by the contact of black blood ; and then adds, that he does not believe any person could resuscitate the motions of the heart when they have been once destroyed (*anéantis*,) by the contact of black blood ; for, in order that the florid blood should vivify the heart, it must penetrate its fibres ; and, if the circulation has ceased, how can this be brought about ? †

These assertions and this mode of reasoning might be conceded to him, if it were true, that, when the contractions of the left auricle and ventricle are made to cease by the contact of black blood, their power of contraction is at the same time destroyed, for it is then clear that these contractions could not be renewed again by the application of florid blood. But there

* By this word we understand the ordinary contractions of the heart which propel the blood into the arteries and keep up the circulation, and not those feeble and irregular oscillations of the muscular fibres of this organ, which often continue in some animals a long time after the ordinary contractions have ceased.

† Agreeably to his hypothesis.—Rech. Physiologiques, p. 245.

are numerous examples of asphyxia from submersion, where the contractions of the left auricle and ventricle have been made to *cease* by the contact of black blood, and where these contractions have been renewed again, after an interval of some minutes, by the application of florid blood. Many examples of the kind have been witnessed in the ordinary process of resuscitation after submersion in the human subject, and they are still more striking after submersion in some of the smaller quadrupeds, as in the kitten and the young rabbit, &c. where the contractions of the left auricle and ventricle may be renewed after a cessation of from twelve to fifteen minutes; but, most of all in some of the cold-blooded animals, as the frog, the toad, or the lizard, where the interval between the cessation of contraction and their renewal again may be extended to a much longer time. These facts are sufficient to prove, that, when the left auricle and ventricle cease to contract, their power of contraction is not at first destroyed, and consequently, that Bichat's reasoning here has proceeded from a false principle. In a subsequent part of his inquiry, and whilst repeating the experiment of removing the sternum and inflating the lungs, Bichat confesses he was much struck, after a short suspension of the inflation, with the rapidity of the changes produced on the first readmission of air, both upon the colour of the blood in the trunks of the pulmonary veins, and upon the left auricle and ventricle also. "When I admitted the air into the lungs," he says, "the blood became red, 'presque tout à coup,'" and the spring from the artery was at the same instant increased. This sudden renewal of contraction, he acknowledges, seems to have been produced by the simple contact of the florid blood upon the internal surface of the left ventricle, since there is not time for it to penetrate the fleshy fibres. Yet notwithstanding this direct connexion of events in the apparent relation of cause and effect, which he acknowledges embarrassed him very much, he still wishes to explain their production upon another and a doubtful principle, rather than fairly abandon his first opinion. In these examples of inflation, he says, "The air rushing with impetuosity into the lungs, thus excites the animal to make great efforts both to inspire and to expire; by these efforts the lungs are unusually distended, and they then come in close contact with and compress the external surface of the heart, which is in this manner excited to contract and to expel the blood with its usual force." Now, as a part of the lobes of the lungs lie contiguous to the heart, it cannot be denied that in a full expansion they may press a little upon this organ, but this pressure must be inconsiderable, as it is made through the medium of the pericardium, which must weaken its effect; and that it does so, is plain from

this fact, that we do not perceive the pulse accelerated after a deep inspiration. There is besides a class of animals of which the frog and the toad form a part, where the lungs lie in the abdomen, and in their full expansion do not appear to touch the heart; yet in these animals when asphyxiated, the contractions of the heart are renewed after a full inspiration, as soon as the florid blood comes in contact with it, in the same manner and with the same rapidity as in animals having their lungs in the thorax. But Bichat, as if aware that these examples might be fatal to his argument, protests here against extending experiments to this class of animals, because the action of their lungs is not in such an immediate relation to the heart as in the warm-blooded animals. It is indeed true that there is a slight difference in the mode of relation between the heart and lungs in cold-blooded animals, but the real connexion between these organs can hardly be said to be less immediate.*

The heart of the frog and the toad having but one auricle and ventricle, only a small part of the blood is sent to the lungs in every round of circulation, by a branch from the aorta. This blood returning from the lungs, with its acquired florid colour, is poured into the heart along with the black blood, brought there by the *venæ cavæ*; and although its florid colour is in this manner diluted, the mixture itself appears to be still possessed of enough of this colour to keep up the contractions of the left auricle and ventricle; for when this rivulet of blood from the lungs loses its florid colour, these contractions cease, so that the connexion of the heart with the lungs is as immediate here as in those animals which have two auricles and ventricles, and it has the great advantage of being more simple, and more easily subjected to observation,—two circumstances always extremely favourable to experiment. Hence it is, that some of our best physiologists have appealed to the lower classes of animals, with a view to remove any obscurities, or to reconcile discordant opinions respecting the nature of the different functions of the human body. On this particular subject, the indefatigable and acute Spallanzani was employed several years, and he recommends us to begin our experiments with the lower classes of animals, on account of the simplicity of their structure, and then to proceed step by step from genus to genus and from class to class, until we arrive at those animals possessing a more complicated structure, in order ultimately to succeed in attaining a perfect knowledge of the mechanism of respiration in man.”—*Memoirs on Respiration*, by L. Spallanzani, page 38.

* Rech. Physiologiques, p. 209.

ART. V.—*Cases of Hare-Lip, with protrusion of the central part of the Alveolar Process of the Upper Jaw.* By ANDREW DEWAR, Surgeon, Dunfermline.

JAMES MERCER, aged 7 years, residing at Newmill, in the western district of Fifeshire, was born with a deformity of the upper lip, and the central part of the alveolar process of the upper jaw. At the time he came under my care, in the month of October last, the part of the integuments, which should, in the natural state, have formed the middle of the lip, and closed in the septum of the nose, was separated from its ordinary connexions, and hung depending from the tip of the nose. That portion of the upper jaw, out of which the two front teeth grew, was in like manner detached from the rest of the alveolar process, and carried forward and upward, the uppermost part being thrust into the nostrils, and the teeth projecting forward. The nostrils were thus forced greatly asunder, and the soft parts descended from the cartilage of the nose, on each side, in a line slanting towards the corner of the mouth. This projection of the alveolar process, which was covered by its ordinary thin and red membrane, and crowned with two teeth, was separated from the integument of the cheek by a space on either side, which would readily have admitted a large quill. In consequence of this unsupported and flaccid state of the soft parts around the mouth, the lower lip hung down large and prominent, and the saliva run constantly from the mouth. Altogether the boy, the upper part of whose face was more than ordinarily interesting and intelligent, presented an appearance singularly hideous.—(See Figures 1 and 2.)

I resolved to make an attempt to remedy the mortifying deformity under which this poor boy laboured. Taught by experience which I have afterwards to relate, I determined first to remove the projecting part of the alveolar process, and allow the wound thus inflicted to heal before attempting to close in the mouth. Accordingly, I drew a knife around the root of the projection, and, with a pair of cutting pliers, separated it from its attachment to the septum of the nose. I was happily enabled to leave the septum of a sufficient depth to form a well-defined partition between the nostrils.

In about a week, the injury was sufficiently repaired to allow me to proceed to unite the soft parts, so as to form a lip. The integuments were very scanty, for, as I have already stated, they ran downward and rather outward, on either side, from the alæ of the nose, which in this case were unusually dilated, in consequence of the pressure of the projecting bone. I cut

Fig. 1.



Fig. 2.

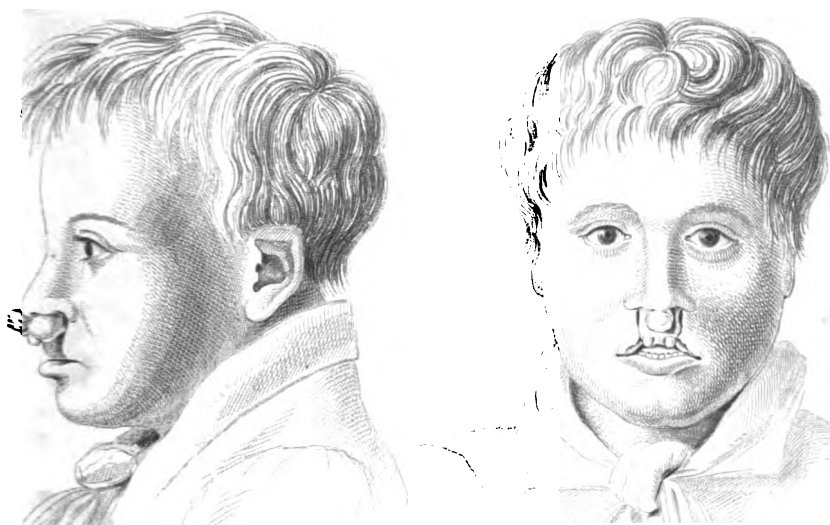


Fig. 3.



Fig. 4.

M^r DEWAR'S CASES OF HARE-LIP.

Fig. 5.



Fig. 6.



Fig. 7.



Fig. 8.

W. L. L. Sculp.

off the edges ; and, by passing one pin as high, and another as low as possible, I succeeded in bringing the sides of the wound into accurate contact. The piece of thickened integument which hung from the tip of the nose being useless, I cut it off.

The chief obstacle in all such cases to the healing of the wound, arises from the strain which is thrown upon the pins, from the natural tendency which the cheeks have to retract, more especially on any motion of the mouth, as in eating, speaking, crying, &c. Irritation and pain are thus produced, and the healing process is greatly interrupted. In this instance the disposition to retraction was very considerable. This I endeavoured ineffectually to obviate by compresses and strips of adhesive plaster. Louis's bandage was likewise tried, but with no better effect ; a contrivance which I have, in every instance, found equally troublesome and inefficient. It occurred to me, that, as a very slight degree of pressure on the cheek on each side near to the corner of the mouth relaxes the upper lip, a narrow piece of steel having a spring might be so adapted as effectually to answer my purpose. I had, accordingly, a spring made, nearly resembling a pair of sugar-tongs, and so padded as to press on the cheek near the mouth. It was kept in its place by a narrow tape tied over the chin, and by three tapes which were fastened one behind, and one on each side, to a piece of leather placed on the crown of the head. This simple contrivance answered every purpose admirably. I could relax the lip by it to any degree I wished, and it could be worn without the smallest inconvenience. The strain was thus taken off the pins, and the process of healing advanced in the most favourable manner. One pin was withdrawn on the fourth, and the other on the fifth day. The spring was worn for a few days longer. On the ninth day the boy returned home so much changed in his appearance, that it was scarcely possible to recognize him. The saliva which formerly ran from his mouth, he can now fortunately retain. See Figures 3 and 4.

Eliza Cant, an infant about six weeks old, was brought to me from Alloa in March 1829, with a hare-lip, exactly resembling in its external appearance that which I have already described. The integument which should have formed the centre of the upper lip was attached in the same way to the tip of the nose ; part of the alveolar process, with the rudiments of the two front teeth, was in like manner separated from the rest of the bony gum, and projected upward and forward, so as greatly to dilate the nostrils. In a word, the two cases differed in nothing, except that the palate in the child was deficient only in a very slight degree. See Figures 5 and 6.

In this case, which came under my care some months before

that of the boy Mercer, I was induced both to remove the projection, and attempt the union of the lip at the same time. This proceeding, however, I had reason to regret, for such a degree of inflammation succeeded the removal of the projecting part, that union of the lip by the first intention seemed very improbable, and I therefore withdrew the pins on the fifth day, and sent the child home. On the 24th of January 1830, the child was again brought to me. The integuments of the lip were somewhat ampler than in the former case. I cut off the smooth edges, and brought the sides of the wound into close contact by the twisted suture. I also removed the piece of hard and thickened integument which was attached to the tip of the nose. A spring bandage, similar to that described in the former case, for the purpose of taking the strain off the pins, was likewise applied. On the fourth day one pin was withdrawn, and on the fifth the other, when the lip was found to be completely united. The bandage, however, was continued for a few days longer. By the eighth day the union seemed so perfect, that all farther precaution was considered unnecessary. See Figures 7 and 8.

It is a point of some interest to determine the proper period at which the operation for hare-lip, or any similar operation, may be performed upon a child. Though no bad consequences followed in the case of the child Cant, at the early age of six weeks, yet instances have occurred in which the shock of the operation produced severe and even fatal effects upon the susceptible infant frame. A short delay is therefore in most cases proper. Perhaps by the time the child has attained to the age of eight or ten months, especially in the absence of the irritation of teething, such an operation as that for hare-lip may be safely performed.

The drawings, for which I am indebted to my friend Mr Campbell, represent with striking fidelity the appearance of both cases before and after the operation.

It is not my intencion to enter into any speculation respecting the very strange and unaccountable effects produced upon the *fœtus* in utero, in consequence of impressions made upon the passions or imagination of the mother. My only purpose is to add another to the already ample catalogue of such remarkable occurrences.

The mother of the child, whose case I have last related, resided previous to her marriage near the boy Mercer, and was perfectly familiar with his appearance. Soon after she became pregnant with her second child, she was strangely impressed with the idea that her infant was to be born deformed, and she has repeatedly assured me that the figure of Mercer was rarely

absent from her imagination. Indeed, (which is of more consequence) she mentioned to some of her friends, previous to her confinement, the unaccountable presentiment she entertained of the child's deformity.

It is probable that much diversity of opinion will exist respecting the influence which the deformity in the boy may have had in producing that of the child. One circumstance, however, deserves remark, viz. that, had the deviation from the natural structure been merely a common hare-lip, the occurrence might with justice, perhaps, have been regarded as purely accidental, and the alleged presentiment of the mother treated as a fable. But the deformity as it presented itself in these cases, is, so far as I have seen, very rare; and nevertheless the resemblance between them was so exact, that, had the children been of the same age, it would, I believe, have been impossible to discover, on an external examination, the smallest difference; thus increasing the probability, that some connexion, mysterious as it may be, does exist between the one and the other.

Dunfermline, 25th February 1830.

ART. VI.—*Reports on the Diseases and Weather of Dublin.*

By D. J. CORRIGAN, M.D. one of the Physicians of the Sick Poor Institution.

REPORT FIRST. *

THE present report comprehends the diseases treated at the Sick-poor Institution of Dublin, between the 1st December 1829, and the 28th February 1830. The following is a tabular view of the various diseases which have been treated during that period.

| | | | | | |
|----------------------------------|----|---------------------------------|----|----------------------------------|-----|
| <i>Fever.</i> | | Peritonitis, . | 3 | Cynanche anginosa, . | 2 |
| Febris synochus, . | 57 | Hæmorrhoids, . | 2 | Catarrh, . | 212 |
| — infantil. remitt. . | 21 | Prolapsus ani, . | 2 | Apoplexia pulmon. . | 1 |
| | | Tænia, . | 2 | Pneumonia, . | 9 |
| <i>Diseases of the digestive</i> | | Ascarides, . | 8 | Phthisis, . | 5 |
| <i>organs, &c.</i> | | Hepatitis, . | 15 | Emphysema pulmon. . | 3 |
| Cynanche tonsillaris, . | 6 | Ascites, . | 1 | Pleuritis, . | 7 |
| — parotidæa, . | 1 | Retentio urinæ, . | 1 | Pleurodyne, . | 1 |
| Cancrum oris, . | 5 | Incontinentia urinæ, . | 3 | Pertussis, . | 5 |
| Dyspepsia, . | 19 | Tabes mesenterica, . | 1 | Cordis aneurysm. pas- | |
| Pyrosis, . | 3 | Scrofula, . | 9 | siv. . | 1 |
| Constipatio, . | 38 | | | — valvul. vitia, . | 1 |
| Colica, . | 24 | <i>Diseases of the respira-</i> | | | |
| Diarrhœa, . | 18 | <i>tory organs, &c.</i> | | <i>Diseases of the brain and</i> | |
| Dysenteria, . | 9 | Epistaxis, . | 1 | <i>nerves.</i> | |
| Choleta, . | 2 | Laryngitis, . | 6 | Apoplexia, . | 1 |

* From the Book of the Sick-Poor Institution of Dublin.

92 Dr Corrigan on the Diseases and Weather of Dublin.

| | | |
|---|---|----------------------------|
| Paralysis portionis duræ, 1 | Uteri hæmorrhagia, 1 | Urticaria, 3 |
| ----- nervor. axil- lar. 1 | ----- cancer, 1 | Psoriasis, 2 |
| Epilepsia, 2 | Gonorrhœa, 8 | Herpes, 3 |
| Tetanus, 1 | Syphilis, 14 | Scabies, 44 |
| Convulsio, 1 | Gland. prostrat. in- flam. 1 | Varicella, 1 |
| Hysteria, 7 | <i>Diseases of the eyes.</i> | Eczema, 3 |
| Vertigo, 1 | Ophthalmia, 7 | Pemphigus, 1 |
| Cephalœa, 3 | Iritis, 3 | Impetigo, 4 |
| Sciatica, 1 | | Porrigo, 11 |
| | <i>Diseases of the skin.</i> | Furunculi, 3 |
| <i>Diseases of the genera- tive system, &c.</i> | Scarlatina, 3 | Pernio, 1 |
| Amenorrhœa, 7 | Rubeola, 1 | |
| Leucorrhœa, 3 | Lichen, 2 | <i>Articular diseases.</i> |
| | Strophulus, 1 | Rheumatism, 19 |
| | | Lumbago, 5 |

The early part of December was fine ; the weather cloudy but dry, with high winds from S. W. to S. E. The temperature was equable and moderate, the thermometer ranging from 52° to 42°. Towards the middle of the month a sudden change took place. Heavy rain set in with storm from the S. W., succeeded by fog. On the 15th, the wind veered round to the N. W., and the thermometer sunk rapidly to the freezing point. The fog, which continued for several days, was followed by hard frost and some snow, and the thermometer for the remainder of the month never rose above 38°, and was often as low as 30°. In the four last days the wind blew again from the south, and thaw set in with cloudy and foggy weather. The beginning of January was very cold and cloudy, with fog, and the thermometer as low as 26°. The wind which, in the earlier part of the month had been from W. or N. W., changed about the middle of it, bringing heavy snow and hail from the S. E., a presage of a severe season. To the end of February, the weather continued very hard, cloudy, with occasionally heavy rain, and cold, the thermometer constantly as low as 30° at midnight, and seldom above 42° at noon. The same trying weather, with heavy snow, and N. E. wind prevailed through the earlier part of February. On the 7th, thaw set in, accompanied by heavy rain, and storm from the S. E. The middle of the month was fine and dry, the thermometer rising occasionally to 50°, and seldom falling below 36°. For the latter part of the month, the wind was very variable and stormy, with showers of hail and rain, principally from the S. W., but the temperature was equable and moderate, the thermometer ranging about 52°.

During the two last winters there has been very little *Fever*. From the list at the head of these pages it appears, that out of 677 cases, the cases of fever were fifty-seven, or about one-twelfth

of the whole. In the winter of 1826-7, of 336 cases 150 were fever, or nearly one-half.

Cancrum oris is not unfrequently met with. The attacks occasionally have been severe and tedious, the disease recurring just at the moment when the little patient seemed all but cured. It was not altogether confined to children, but sometimes made its appearance in grown up females. The disease commenced with sponginess and bleeding, quickly followed by sloughing of the gums, generally around the teeth of the lower jaw, and very frequently the front teeth, which became loose in their sockets, and fell out. The progress of the attack was often so rapid that even when the little patient was brought within twenty-four hours of the mother's noticing it, the sloughed gum would, when touched, separate from the teeth like rotten animal substance. In ordinary cases the slough was grey,—in bad cases black,—in all accompanied by intolerable fetor of the breath. The tongue and inside of the mouth were generally affected along with the gums, and on the inside of the mouth the sloughing of the mucous tissue often resembled worm-eaten patches. This disease is usually supposed to prevail among badly nourished children, but very erroneously, for the best fed, and most healthy-looking children coming to the institution were those affected by it. To this my colleague Dr Hunt, to whom I have often been very much indebted, first called my attention; and subsequent examination has completely established the truth of his observation. *Cancrum oris* often appeared at the same time in several children of a family. When seen early, the following treatment was generally successful. An emetic was given, and sometimes repeated. This was of invaluable service. Purgatives followed, and the diseased part was well rubbed every day with the solid nitrate of silver until a healthy surface presented. Internal remedies with mild gargles were tried, but were found totally inefficient.

Among the cases of *Diarrhœa* was one of *diarrhœa mucosa*. It occurred in a middle aged man, and was of a year and a-half's standing when he applied. There was no pain, but great debility and anxiety from the frequent evacuations of mucus, amounting to ten or twelve in the twenty-four hours. It made its first appearance after a slight attack of dysentery. Mercury and opium had been pushed far without his receiving any benefit. On the 5th of January an electuary of super-tartrate of potass four parts, and capsicum one part was ordered, a tea-spoonful three times a day. On the 14th the relief was considerable. The electuary with cubebs or capsicum was persevered in, but not constantly, and at the end of a month there was but an occasional mucous stool. Between the powers of cubebs and capsicum I could perceive no difference.

Of the cases of *Hepatitis* one ended in suppuration. B. Tully, aged 31, complained, when I first saw him, of restlessness and inability to lie long in any posture. There was a tumour on the left side of the epigastrium under the edge of the ribs, hard, painful on pressure, with a defined edge on its inferior part and with indistinct fluctuation. The skin was moist; pulse 128; tongue chapped, with florid edge and tip; bowels free. The disease set in fourteen days before, with severe pain, which attacked him suddenly in his sleep, and was preceded in the evening by shivering. His habits had been intemperate. Leeches were applied and cathartics administered, followed by calomel and opium. At the end of seven days the tumour was unaltered; pulse very quick. Purgative medicines were continued, and fomentations applied to the tumour. In three days after diarrhoea suddenly came on. Blood and curdy matter were discharged by stool. The tumour was immediately lessened, and the pain quickly disappeared. The pulse fell, and from this time forward recovery under the exhibition of tonic medicines was rapid. Suppuration of the liver is not at all so rare in this country as is generally supposed. Its progress, as in the case related, is often rapid, and recovery takes place under most unfavourable circumstances. In a patient who was under Dr Hunt's care the abscess burst externally, and discharged perhaps a quart of matter. The liver, which previously had been much enlarged, returned almost to its healthy size, and the recovery was unexpectedly rapid. The patient was a woman of sixty years of age. In examining diseased liver the pleximeter is of material service. When from distended intestines or water the abdomen is so full that the liver cannot be felt, percussion with this instrument will trace its edge with accuracy.

Under the head of *Laryngitis* may be mentioned a case of loss of the epiglottis producing extreme suffering. The patient, a girl of 20 years of age, had been repeatedly put under the influence of mercury, and had had her throat fumigated for the cure of secondary venereal symptoms. Her throat bore the marks of numerous old ulcers. Her voice was low and husky, and any attempt to swallow liquids brought on suffocating and spasmodic cough. She was only able to allay her thirst by swallowing bread soaked in water. The finger passed down found in place of the epiglottis a rounded tubercle on one side of the root of the tongue. Considerable relief was given by opiates, but the treatment was of course only palliative.—The epiglottis, it may be remarked, and even the larynx, can be always readily examined by the finger, and the examination often affords most useful information. There is in making the examination, however, a slight manœuvre necessary. If the finger be introduced at once

to the epiglottis, without touching any of the adjacent parts, it will bring on violent retching and suffocation, and closing of the larynx, with great distress; but if the finger be laid upon the tongue, and passed along its dorsum until it reach the epiglottis, its passage will resemble that of a morsel of food, and there will be comparatively little uneasiness.

Of *Croup* there has been very little, and its rarity strongly shows, that it is a disease not of simple inflammation, but of a specific nature. During the winter affections of the lining membrane of the larynx and trachea were very prevalent, which might have been supposed very likely to bring on, or at least to predispose, to this disease, yet two cases only occurred. Of these one terminated fatally, and mainly through neglect. The only remedy on which, after many trials, reliance can, I believe, be placed, is tartrate of antimony, managed so as to keep up a constant nausea, with occasional vomiting. From calomel I have not seen any benefit obtained. In a case in which the attack was sudden and severe, relief quickly followed the administration of tartrate of antimony. Relapse took place in the course of twelve hours. Calomel was then exhibited, and the child perished. The disease is generally too rapid to permit us to wait for the specific action of mercury. The dose of antimony must be regulated by the effect. To a full and fat child of three years old, with whom the symptoms had been present twelve hours, the respiration laborious and highly stridulous, half a grain was given every half hour until four grains were taken. The symptoms on the next day had disappeared. In consequence of the distress and apparent debility caused by this medicine, it is sometimes not easy to enforce its proper administration, and it is generally necessary to impress strongly upon the mother's mind, that the life of her child depends on her firmness. When seen early, and treated with antimony in the way recommended, the disease is not so fatal as is generally considered. In the observations made in this paper, it is not my purpose to go into the minutiae of treatment, but shortly to point out the main remedies. The circumstances of each case must determine the employment of adjuvant remedies, such as local bleeding, &c.

Catarrh has been very prevalent during the winter. Of the entire number of applicants one-third were cases of catarrh. In the corresponding portion of the preceding winter they formed but one-seventh. A reference to the state of the weather of the corresponding periods of the two seasons will explain this. December 1829 has been foggy and extremely cold, the thermometer being for one-half of the month generally below 32°. December 1828, on the contrary, although damp, was clear, with high winds, the thermometer sinking only once as low as 39°, and

generally ranging about 50°. A similar observation applies to January and February of the two years.

The prevailing catarrh has had very distinctive characters. Although epidemic, it did not present what may be considered as the pathognomonic signs of the severe influenzas, which have at different former periods swept over the greater part of Europe. In those, sneezing, weeping from the eyes, fulness of the eyeballs, distressing pain and sense of constriction across the forehead, soreness of the cheek bones, discharge of thin acrid mucus from the nose, and expectoration of the same kind, with feeble frequent pulse, were the prominent symptoms; and catarrh was often absent, while the other symptoms with low fever were present. The catarrh of last winter, taken in the aggregate, did not present those symptoms. It generally began with hoarseness. This was succeeded by internal soreness, referred to the inside of the sternum, harassing cough, and viscid expectoration. The frontal sinuses were not affected. The pulse was little disturbed. Even when the hoarseness was extreme, and internal soreness great, the pulse was perfectly regular. The stethoscope did not give indications of bronchitis. The disease was purely local, confined to the larynx and upper part of the trachea. From the severe local symptoms about the larynx, the disease was first treated by bleeding, blistering, and calomel and hippo, as a simple inflammatory affection of the larynx and trachea; but it was quickly found that bleeding was injurious. It produced little or no effect on the disease, and it was always followed by great debility. Depletory measures were worse than useless. A contrary line of practice was followed by beneficial results. Dover's powder in large doses; a scruple at bed-time, with nitre or carbonate of ammonia, and pectoral mixtures, with a very large proportion of laudanum. The opium and hippo, or carbonate of ammonia, at bed-time, frequently did not bring on diaphoresis, but passed off by urine, or kept up a glow of heat over the skin. The good effects were, however, the same. The attack of catarrh was often very sudden. In the morning, for example, a patient complained of cough and irritation about the larynx. In the evening the hoarseness was so great that the voice was almost gone. A sudorific, a large dose of ether, with opium, &c. brought on perspiration, or produced a glow of heat over the body, which lasted all night, and the next day the symptoms were gone. Nitre and Dover's powder very often acted on the urinary organs, and always with benefit. This epidemic catarrh differed very much from ordinary inflammatory attacks of the mucous lining of the air-passages in its nature and its

mode of treatment. Indeed, epidemic attacks are frequently different from sporadic attacks, however they may at first appear to be of the same nature. Even epidemics, apparently similar, differ from one another. Other diseases, too, often change their nature, and borrow the type of the prevailing epidemic, and require a similar principle of treatment. These are points very necessary to be remembered in practice; for "that method which is successful one year, may perhaps be destructive another;" and "he moves very uncertainly, that has not in the cure of fevers always before his eyes the constitution of the year, as it favours the producing epidemically this or that disease, and all the other diseases that concur, and are formed into the likeness and similitude of it."* Having given the broad characters of the epidemic, it is necessary to observe, that ordinary inflammatory bronchitis frequently appeared requiring the usual active treatment, and that a few cases occurred, particularly if the patients had been kept warm, in which the frontal sinuses were affected. In pregnant women, in whom an active state somewhat resembling inflammation is going on, it is to be observed, that, *cæteris paribus*, inflammatory affections always run higher than in others, and of course require a corresponding treatment.

Catarrhus suffocans has been very frequent and very fatal during the winter. Where the disease was accompanied by acute bronchitis, indicated by "*râle sibilant*" in the chest, and the patient not very much debilitated, no remedy gave so decided relief as tartrate of antimony, in half-grain doses every two or three hours. Although it brought relief where it produced no sensible evacuation, its effects were nevertheless invariably most beneficial, when its exhibition was followed by copious secretion from the stomach or intestines. It was occasionally combined with opium; but the narcotic seemed to lessen its powers. A case of this disease came under my observation, that might have had a different termination had the proper view of its nature been taken in time. A man 32 years of age had been suffering under the disease for a fortnight when I saw him. The person under whose care he was, supposing, from an intermission in his pulse, the blueness of his lips, and the œdema of his legs, that he was suffering under heart disease, had kept him under the influence of digitalis. I found the two sounds of the heart natural, and the whole of the chest occupied by mucous râle. I had no hesitation in pronouncing the heart sound. His strength was much broken, and he died

* Sydenham.

in four days after my first visit. The examination proved the truth of my diagnosis. The heart was healthy, while the minute branches of the bronchi were completely plugged up with mucus, and their lining membrane deeply injected. This case strongly showed the superior assistance derived from the stethoscope in chest disease.

Pneumonia has been much more rare than might be expected. Catarrh often appeared engaging the whole of one lung, and leaving the other quite free. In this form, without accurate examination by percussion, it might easily be mistaken for pneumonia.

Passive aneurism of the ventricles of the heart is a disease occasionally met with in young and delicate persons. It simulates phthisis. Debility, loss of flesh, sweats, cough, expectoration and quick pulse accompany it. The stethoscope alone affords certainty in its diagnosis. The first sound of the heart is remarkably loud and clear. There is palpitation, and the heart is felt not to strike so much as to swell up against the hand laid over it. In the few cases that have occurred to me, the right ventricle was more affected than the left. A nutritious milk diet, with good air, were the best restoratives, an absence of all stimulants being rigidly observed. There is at present under my care a case of valvular disease of both the auricular and the aortic openings of the left ventricle, marked by two *bruits de soufflet*, one anterior to the pulse, the second synchronous with it. The symptoms complained of at present are some straitness of the chest and palpitation on exercise. The disease is of two months standing.

Both the cases of *Paralysis* were singular and instructive. One was of the portio dura. The patient was a middle aged man. He had for the week previous felt pain about the mastoid process of the temporal bone, when suddenly at breakfast he felt an odd sensation about his mouth, and on looking in the glass, he saw his features distorted. When he applied he had no pain, but the mouth was drawn to the left. When he attempted to whistle, he could not contract the right half of his mouth. When he inspired strongly, the right nostril did not act, nor could the right eyelid be closed. The sensibility of the affected parts was, however, unimpaired. Three blisters over the mastoid process cured him. The next case was still more interesting, showing that in affections of the roots or trunks of the nerves, the symptoms appear at their extremities far from the actual seat of the disease. Thomas Fitzsimmons, aged 48, a weaver, was unable to work at his trade in consequence of a constant tremor of his hands, which had become paralyzed.

The fore-arms were sore when pressed on. The soreness of the fore-arms was felt for some months, but the paralysis and tremor of the hands were present only three weeks. About five months before he had used crutches in consequence of a strain. He had been blistered on the fore-arms previous to his applying, without having received any benefit. Examining the spine, I found that pressure on the lower cervical vertebræ gave pain. A blister was put over this part of the spine. On the next day the right arm was steady. A repetition of the blister gave him the use of both arms, and in a few days he was able to return to his trade. On the case of tetanus, as it is at present under treatment, I shall defer the observations.

In *Leucorrhœa* cubebs is the most valuable remedy I have had experience of. It has been generally given in electuary with supertartrate of potass.

Among the cases of *Ophthalmia*, one deserves mention. The patient, a fine child of 6 years old, complained of some pain in the right eye. There was inflammation of the conjunctiva, the pupil was immoveable, and on looking sideways, the iris was seen, not perpendicular, but convex, impelled by the vitreous humour and lens against the inner surface of the transparent cornea. The sight of the eye was gone. When about four ounces of blood were taken from the temporal artery, the little patient cried out that she could see. A blister was applied to the neck, and sugar of lead lotion to the eye. After a few days the eye had quite recovered its functions, but a large ulcer remained upon the cornea, which, however, was soon healed by dropping on it saturated solution of acetate of lead. For ulcers of the cornea, and chronic inflammation of the conjunctiva, this solution is less painful than that of nitrate of silver, and I believe more efficacious.

The cases of *Iritis* were all venereal, and yielded to corrosive sublimate. In one of them turpentine had been tried, but unsuccessfully. Another case occurred in conjunction with excoriated sore throat and venereal psoriasis, thus setting at defiance Mr Carmichael's ingenious classification of venereal diseases.

Eczema occasionally makes its appearance in children as a sequela of the fever of vaccine inoculation, and is very difficult to remove. Jalap and nitre persevered in were most efficacious in removing it. In one case of a full fat child four years old, whose body was quite covered, ten grains of jalap with five of nitre were given at first every night, after some time every second night. To another child of two years old, whose face was thickly covered, three similar doses were given, one each night, and were followed by striking amendment.

Porriga has been very frequent; it was usually the *porriga scutulata* or *favosa* of Bateman. In the alterative or internal medicine recommended by him, there is not, I believe, the slightest trust to be placed. A covering of oiled silk, and under it lint, kept moist with acetate of lead lotion, first recommended in this way by Dr Macartney as a water-dressing, will remove the disease. This, however, is expensive to the poor. The following ointment applied every night and morning, the requisite cleanliness being observed, is equally efficacious: Eight parts of *Ung. Resin. Alb.*, one of *Ol. Terebinth.* and one of *Acet. Plumbi.* The only alteration I have made in this ointment from the formula which I received from Dr Hunt, is an increase of the proportion of the two last ingredients.

I have now noticed the most striking diseases that have occurred to me during the last three months. In the reports which I purpose to continue on the diseases of Dublin, it is my wish to make Bateman's Report of the diseases of London my model, giving, as far as I can, practical observations and information, sketching only the broad lines of disease, and the main treatment, omitting the minutiae which elementary works or experience afford to every one. For the classification of diseases which heads this report, it is not my intention to offer either an apology or defence. I am far from supposing it perfect. I have chosen that which I think most useful, grouping together diseases of systems, as the digestive, respiratory, &c. and organs connected with them in function, or placing under one head diseases of an organ, as of the skin. To fevers I have left a separate class, as they are a neutral ground, on which all disputing nosologists may meet.

18, *Bachelor's Walk*,
March 6, 1830.

ART. VII.—*Observations on Acupuncture.* By JOHN RENTON, M. D. Penicuik.

NOTWITHSTANDING the encouragement which the writings of Cloquet held out for the relief of neuralgic and rheumatic affections by means of acupuncture, it does not appear, if we may judge from the few cases upon record, that the practice has been generally adopted in this country. To whatever cause the neglect of so powerful an agent in the removal of disease may be owing, there can be no doubt in my mind, that the more acupuncture is tried, the more it will be found un-

deserving of the public and professional obloquy, under which it has so long laboured; and that in many cases where all the ordinary means of cure have been ineffectual, it will prove a very certain and speedy remedy. But if the system is too much undervalued now, it is equally true, that it was very much overvalued by those who first recommended it to notice, and that in this way it has greatly suffered from the indiscretion of its friends. The utility of a specific is very readily suspected, when its infallibility is given out for the removal of too many diseases, and more particularly of those between which no analogy can be traced. And when, moreover, no satisfactory explanation can be afforded of the *modus operandi* of the reagent, professional persons, unhappily for the interests of medical science, are too apt to reason upon the authenticity of the facts averred, instead of adopting the more simple and direct method of determining their value by subjecting them to the test of farther experience. Indeed, the different attempts which have been made to account (as by electricity for example) for the various physical and physiological phenomena produced by acupuncture, have been very injurious to the successful diffusion of the practice; and accordingly we find, that the very rapidity and perfection of the cures have acted as causes why the efficacy of the remedy has been doubted, and that its boasted recoveries have been imputed more to mental reaction,—that is, to impressions acting upon the patient's mind from a fancied and mystical confidence in the use of the means employed,—than to any real good effects resulting from the operation itself. The experience I have had has led me to form a favourable opinion of its utility, and without endeavouring to theorize on a subject upon which so much must yet be known, before any thing satisfactory can be offered, I shall merely state the result of the trials I have made, in the hopes of gathering further information, by inducing other medical men to try the effects of a remedy which, not to overstrain its character, I have found to be a sure, safe, and speedy one in several painful affections.

My attention was first directed to the use of acupuncture in an inveterate case of chronic sciatica, under which Sir Thomas G. Carmichael, Bart. long laboured, and which had resisted the usual routine of practice,—galvanism, leeches, blisters, pitch plaster, and all the ordinary local applications in the form of warm baths, stimulating liniments, and lotions, as opodeldoc, tincture of cantharides, essence of mustard, cajeputa oil, &c. Tar pill, a course of sulphate of quinine, blisters to strengthen the constitution, the wearing of flannel and shamoy, and friction

of the parts were also attended with unsuccessful effects. The disease was of several years standing, but the paroxysms were, according to accidental causes of aggravation, of shorter or longer duration, and attended with pain of greater or less violence. The pain extended along the course of the sciatic nerve, and after a day of more than usual exercise from walking or even riding upon horseback, was extremely severe. Transitions in the state of the weather brought on also violent attacks of the disease. At other times, without any apparent cause, he could not walk without experiencing very much uneasiness from stiffness in the muscles of the right thigh and leg; and when that feeling went off by gentle exercise, it was succeeded by a more disagreeable sensation of numbness, want of power, and a sense of weariness in the affected parts. The pain of late was almost always constant in the hip-joint to a greater or less degree, and in the gastrocnemic muscles, so that he could not sit for any length of time without having occasion to rub the calf of the leg to relieve the uneasy feeling in it,—a feeling he compared to something gnawing the bone. Though he was not entirely confined to the house, he was able to take but little exercise, and was so lame as to be obliged in a great measure to give up shooting. Suffering so much, he was anxious to try any thing for the removal of the disease.

As a last resource, I recommended him to try puncturing the parts with needles. I told him of two or three remarkable cures which I had heard were performed by these means in Dumfriesshire—a district of country where I believe the practice has long been known. But when I mentioned that the operation of introducing the needles was unaccompanied with pain, he was disposed (as many others are) to treat the whole affair with much more scepticism than confidence. In the course of the afternoon, he was induced, by the example of a gentleman who first performed the operation upon himself, to insert two or three common needles in the calf of his leg, and was surprised to find both that the insertion occasioned no pain, and that the pain in the leg after the needles had not remained longer than a minute *was entirely removed*. By introducing two or three more needles into the thigh, he completely regained the use of his limb, and was able to walk into the dining-room shortly afterwards without pain or uneasiness. When I called in the evening, I found him completely cured by the needles of the disease, with which I left him affected in the morning, and since that time more than eighteen months have elapsed, and he has been able to take every kind of exercise without experiencing any return of the affection. The needles were in a

high state of oxidation. So far, therefore, the cure was both *instantly*, and appears to be *permanently* established.

From the successful issue of this case, I resolved to take the first favourable opportunity that occurred to me, of again trying acupuncture, and I had occasion to do so shortly afterwards upon a farmer who was affected with a most violent paroxysm of sciatica. He was a great martyr to chronic rheumatism, and had brought on the attack of sciatica he laboured under when I saw him, in consequence of being exposed to damp and cold, when fishing about three weeks before. He was for eight days confined to the house, and with great difficulty could move from one room to another from pain which, extending from the right acetabulum to the tendo Achillis, deprived him of the power of bending the hip and knee-joints. In consequence of this, he was very much bent to the diseased side, and from the weakness and pain in the affected limb, he could not bear the weight of his body upon it without the help of a crutch, so that his moving forward was effected more by a sort of lateral halt than a walk. On examination, I found no swelling; but considerable pain was experienced upon pressure in different parts, and these I fixed upon as the most appropriate places for introducing the needles. After some hesitation he consented to the operation, but with little faith in its utility, and with still less reliance upon my assurance that it was not to be a painful one.

Not having my case of needles with me, I used half-a-dozen common ones of different sizes. Three of these I put into the middle of the *soleus* fully an inch and a-half, and allowed them to remain three minutes. I perceived that they were very much shaken by the contractions of the muscle, which held them so firmly as to require a sharp pull to extract them. He felt no pain when I inserted them, and only a little when I took them out. He was almost instantly relieved of the pain in the calf of the leg, and was quite astonished that he could move his leg without feeling any uneasiness. I found no difficulty in persuading him to allow me to extend the benefit of the operation to the thigh, where I introduced three other needles, more than an inch and a-half deep into the middle of the *vastus externus*. They remained about five minutes, during which time I observed the muscle, from the motions of the needles, was affected with violent contractions. The operation acted like a spell, for immediately after it he walked perfectly erect, and without pain. I remained with him an hour or two, and upon my departure he accompanied me to the offices, which are at a little distance from his house, without feeling any weakness or difficulty in walking. More

than a year has elapsed, and he has not had any relapse of the complaint.

The second case in which I employed acupuncture was that of a young woman, who was suddenly seized when at work in the field with pain in the hip-joint, extending to the middle of the leg, to so violent a degree that she fell down, and was carried home. I was sent for, and saw her in the course of three hours. She was lying in bed upon her face, in the same position in which she had been first placed, being unable to move her body in the least degree; and she was screaming with pain. She was perspiring profusely, but no fever was indicated by the state of her pulse. She received no injury upon the part to account for the pain, the attack being equally violent as it was unexpected. Without mentioning what I intended doing for her relief, I introduced five needles about two inches into the *glutæi* muscles, two into the *vastus externus*, and, at the same time, three others not so deeply into the back part of the leg, the parts she complained of most severely. I allowed them to remain five minutes, and took them out without her being aware of what I had done. After the operation she felt immediately great relief, and was able to turn herself in bed. I gave a strong purgative draught, and my assistant, Mr Henderson, upon calling next morning, found her continuing well, when at rest, but still affected with pain when she moved the hip-joint. He therefore introduced six needles, which mitigated the pain as much as the first operation did, but they did not wholly remove it at the time. In the course of the day, however, it went off altogether, and she resumed her work next morning.

Three months have elapsed, and she has never had any return of the complaint. Though the removal of pain was not at first so wholly effected as in the two former cases, the relief obtained was obtained as quickly and as permanently. This case supplies one important fact, viz. that the removal of the pain could not be attributed to any impression acting through the medium of the imagination in the way of hope or fear contributing in the cure, as the woman neither saw nor knew the nature of the operation performed upon her.

The utility of acupuncture was very evident in this case, for had the usual means been employed, as leeches and the warm-bath, I have no hesitation in saying, that the woman's sufferings would not have been so readily and quickly alleviated as they were, since the application of hot fomentations to the parts, continued for two hours before I used the needles, had not the slightest effect in mitigating the pain.

A weaver in this village had been affected for nine months

with rheumatism to a greater or less degree in the right arm. The disease was almost wholly confined to the deltoid muscle, and was attended with so much pain and want of power in moving the arm, as in a great measure to disable him from working. Six two-inch needles were introduced into the affected part, and allowed to remain five minutes. The poor man was *immediately* relieved of pain, and regained the use of the arm. He has been at his usual employment for these last five weeks, and has had no return of the complaint.

I was myself cured of a similar affection in the left deltoid, which, for two days, gave me very great pain when I endeavoured to extend or raise the arm, so much so, indeed, that I could with difficulty put on my coat or assist myself in eating with the left hand. The introduction into the muscle of four needles for three minutes, at once completely removed the affection. The needles were agitated, I observed, by the contractions of the deltoid, and were in a state of considerable oxidation. The only disagreeable, for it was not a painful feeling, I experienced after the needles had remained three minutes, was a sensation of numbness, which extended along the arm to the fingers.

A gentleman had suffered very much for upwards of a year from a painful affection of the *supinator radii longus*. He had fomented, leechcd, blistered, and rubbed all sorts of stimulating embrocations, and wore flannel upon the parts without experiencing any relief. Two or three needles introduced into different parts of the muscle instantly relieved the pain he felt when he rotated the hand and laid hold of any object. He shook hands with me immediately after the operation without feeling any kind of hindrance or uneasiness; and more than two months have elapsed without his having had any return of the complaint. I observed the contractile power of the muscle was very much called into action by the needles, and that the needles were in a high state of oxidation.

I might add several more cases to prove the utility of acupuncture in rheumatism if it were necessary, but I shall defer doing so till some future opportunity. I shall merely remark, that its effect in removing the pain of lumbago, I have found to be nearly as great as in the preceding cases; and such indeed might have been expected from the similarity of the complaints. I have also tried it in a bad case of hip-disease, not in the hope of effecting any thing like a removal of the disease, but with the intention of mitigating the violence of the pain; and in one instance, in which the girl had brought on a violent attack of pain from using the diseased limb too much, the introduction of six needles into the *glutæi* muscles removed the excruciating pain.

My experience of it in bad cases of sprains and bruises, after the inflammatory stage is gone off, warrants me in saying, that the pain and weakness of the parts consequent to such injuries will be greatly benefited by the use of the needles, and that in tedious recoveries from such accidents, they afford a means of cure which ought not to be neglected.

I shall conclude by summing up all the observations I have had occasion to make upon this remedy.

I. The introduction of the needles in no instance occasioned pain to the individual.

II. In many cases the operation removes pain instantly, and, so far as their history goes, permanently.

III. In those instances in which a *complete cure* does not take place at once, the pain is always to a great degree relieved by the first trial, and at last is wholly removed by the further use of the needles. It seems to be a readier mode of alleviating pain than any other I am acquainted with.

IV. But it is not only a ready and sure method of removing, or (to say the least of it) of very much alleviating pain; but, what is of very great consequence, it appears to be a very safe remedy, no bad effects having ever followed its use in any of the cases in which my assistant and I have employed it. We have tried it upwards of fifty times, and no local or general injury has ever supervened in the form of inflammation of nerve, muscle, or tendon, or in the occurrence of any tetanic affection. A slight areola only surrounds the punctured part when the needles have remained five or ten minutes.

V. It appears to be most useful in removing muscular cramp or spasm, and in that way I account for its success in chronic rheumatism. If the muscular fibre be the seat of the disease, and can be transfixed by the needle, I think a very certain cure may be anticipated. In such cases I have uniformly observed by the motion of the needles, that increased muscular contraction was produced, and that to this newly excited action, it occurs to me, the removal of pain may be owing, the needles operating as local irritants. But this is merely matter of opinion, and does not explain the sudden removal of pain, which acupuncture effects in those deep-seated rheumatic complaints, which are not seated in the muscles.

VI. When the needles have remained three minutes or upwards, a numb and prickly sensation is in most cases felt around the parts punctured, and when they have been inserted into the glutæi or deltoid, that sort of feeling extends along the course of the limbs to their extremities. This sensation I have found to be a favourable symptom, the removal of pain to a greater or

less degree following it. I have known, however, several cures effected without it.

VII. The needles after they had remained for three minutes or so were always in a state of oxidation.

I shall not attempt to theorize upon the nature of the operation of the remedy, as a much more extended knowledge of facts is necessary before one can with safety venture upon such an inquiry.

Penicuik, April 29, 1830.

ART. VIII.—*An Account of two cases of Malformation.—I. Of the Heart, with Morbus Cæruleus.—II. Of the Head, Cervical Spine, Diaphragm, &c.* By WILLIAM CAMPBELL, M.D. Lecturer on the Practice of Physic and on Midwifery.

CASE I.—*Case of Morbus Cæruleus and Malformation of the heart, in a child 13 months old.*—T. M. a male child, born on the 17th February 1829, of healthy parents. From the time of birth the subject of this case presented a livid appearance of countenance, and occasionally also of the general surface. Under circumstances of irritation, the livor became of a deeper shade, and it was at all times more conspicuous on the lips, and on the nails of the fingers and toes, than on any other point. From the first the countenance appeared dull, and the child never became so lively as most infants of the same age. The heat of the body was always much below the natural standard; the great coldness of the breath had been noticed by every one; and there was intermission of the pulse from an early period. When an attempt was made to cause him to take any other nourishment than that furnished by the breast of the parent, it almost excited convulsions; bathing him had nearly a similar effect; and when he was about to evacuate the bowels, whether naturally or by the aid of medicine, he seemed particularly distressed. While in the recumbent or even semi-recumbent position, he appeared easy; but any change from either was followed by screaming, with hurried and difficult respiration.

Until within four months of his decease, which happened on the 24th March 1830, he throve almost as well as children usually do; but from this period, a troublesome suffocative cough was frequently present; he daily experienced repeated attacks of violent convulsions, and emaciation gradually followed. The irritation of dentition, and that arising from pertussis,

under which he ultimately suffered, evidently contributed to induce these latter symptoms.* There was no distinct evidence of effusion into the brain, as the child, until within a few hours of his death, continued to notice surrounding objects, and to recognize his parents.

Post mortem Examination.—The countenance was not in the least discoloured; but the trunk, arms, and more especially the lower extremities, were purple. When the thoracic viscera were exposed, the pleura throughout appeared sound; the lungs were equally so, but considerably smaller than they are usually found in a child of this age. In the bronchial trunks, a little thick mucus resembling pus was seen; but squeezing portions of the lungs failed to produce any such exudation from their substance. The vessels of the pericardium were minutely injected; and from this capsule, on being laid open, about six drachms of greenish serum escaped. Hypertrophy of the right side of the heart was quite evident. The right auricle, filled with dark semi-coagulated blood, was five times larger than the left, which was scarcely the size of that in an infant at birth. The right ventricle was much thicker, and more than twice the size of the left. The aorta arose from the right, as well as the left ventricle; and the communication between the former cavity and this large vessel was so free, that the little finger could with facility be passed from the ventricle into the ascending portion of the artery, the area of which, to the point where the arch commences, was nearly three times the usual capacity in a child of this age; its *vasa vasorum* were unusually numerous, and very turgid. The right ventricle also furnished a pulmonary artery which possessed valves, and was divided into the usual number of branches; its structure was delicate, and the area of its trunk little larger than that of a crow quill. The divisions of this artery were of course small. The remains of the *ductus arteriosus*, though small, could be easily traced; it was imperious in its centre, but pervious both at its commencement and termination. The *foramen ovale* was nearly closed. In the abdominal cavity, a remarkable deviation from the natural arrangement was discovered. The sigmoid flexure of the colon lay in the right side under the small intestines, instead of being situated in the left. The brain was not examined.

The structure of the heart in the foregoing case explains many of the phenomena observed during life. From the far greater capacity of the right ventricle, and the greater thickness of its parietes compared with those of its opponent, it is a natu-

* For some little time before death the tongue had become aphthous; and such of the teeth as had protruded were much decayed.

ral conclusion that the left ventricle was very little concerned in propelling the blood through the body, and that this function was chiefly performed by the right. It is also evident, both from the delicacy and small size of the pulmonary artery and its branches, and, on the contrary, the great capacity of the aorta and its free communication with the right ventricle, that the principal part of the circulating mass did not pass through the lungs; and, consequently, that the greater portion of the blood in the arteries was venous. This latter conclusion is further supported by the diminished temperature of the body, and the remarkable coldness of the breath, which are interesting facts in corroboration of Crawford's theory regarding the source of animal heat. The livor of the general surface showed that the venous predominated over the arterial principle in the blood; and the inanimate aspect of the child may be ascribed to the blood, from its defective arterialization not imparting that stimulus to the brain and nervous system which it is wont to do in the natural state. The diminutive size of the lungs must have been owing to the small quantity of blood which traversed their substance. It can scarcely be maintained that the nourishment of these organs after birth depends solely on what they receive from the bronchial arteries. Moreover, in-osculations of the pulmonary with the bronchial arteries have been proved, by injections passing from the former into the latter. The distress observed while the fæces were voided may have arisen from the altered situation of the sigmoid flexure of the colon.

In almost all the recorded cases of morbus cæruleus arising from congenital defect, diminished heat of body has been particularized; but coldness of the breathing, as in the foregoing example, has not been mentioned by any one, so that I presume it is to be viewed as an occasional, if not as a very rare attendant.

CASE II.—*Description of a Female Fætus of the Human species presenting a variety of Malformations.*—The foetus, of which the following is an account, occurred on the 2d of May 1830, in the practice of Mr Briggs, an eminent practitioner in Preston, Lancashire, and was forwarded to me by Mr Robert Brown, surgeon to the public dispensary of that place. It was the first labour of the woman who gave birth to this production, which, though it presents the appearance of old age in miniature, and, according to the parent, has been retained to the full term, yet is little larger than a foetus expelled at the close of the fifth month. Its limbs, however, are large compared to the body; and the feet are distorted. The *liquor amnii* was unusually abundant; and I have had occasion to

make the same remark in every case that has happened in my own practice, where the foetus was *acephalous* ; and also where it was small and delicate or emaciated. In this instance, an arm presented, and the version of the foetus was performed.

This foetus is defective in many other respects. The bones forming the upper part of the cranium are wanting, and almost the whole of the brain. The little that remains of this organ forms a bloody purple-coloured pulp, without distinctive parts or organization. At the posterior margin of an imperfect *os frontis*, after the removal of the cerebral matter, are two bony tubercles, diverging behind ; and posterior and below these are two nervous trunks corresponding to the optic nerves. About two lines behind these last are other two nervous trunks, apparently corresponding to the fifth pair. Three lines posterior to these again, and somewhat laterally, are other two nerves, which would seem to be the seventh pair. Still further out, and behind what are thought to be the seventh, two additional nerves present themselves, which correspond to the eighth pair.

There are no cervical vertebræ ; the head is articulated to the dorsal spine, the greater part of which is open posteriorly.

The chest is exceedingly short ; and on laying it open, the absence of the diaphragm was discovered. The thymus gland, comparatively large, occupies the centre of the chest. Immediately below the most dependent part, and very little larger than the body, is the heart of the natural formation. On each side of this latter organ, low down in the chest, but chiefly among the abdominal viscera, are the lungs, of a pale hepatic colour and oblong shape, each about the size of an ordinary oyster.

A portion of the colon is seen in the left cavity of the chest, on the left side of the heart ; but all the other viscera proper to the abdomen are contained in a strong membranous receptacle, which occupies the space between the margin of the thorax and near the crest of the ileum ; and which, independent of its internal communication with the thorax, has so large an external opening as to display the whole of the liver and intestines. Intimately connected with, but forming no part of this imperfect sac, is that constituted by the membranes of the ovum. Exterior to, on the right side, but adhering to the bag which contains the intestines, is the umbilical cord, proceeding as far as the margin of the thorax, where its vein penetrates the parietes, and enters the liver.

The brim of the pelvis is closed up by a continuation of the common integuments ; and subjacent are the proper pelvic viscera.

Edin. 4, Picardy Place, April 1830.

ART. IX.—*Case of Phlegmonous Erysipelas successfully treated by the Nitrate of Silver.* By JOHN HODGSON, Esq. Member of the Royal College of Surgeons in London, and Junior Surgeon to the Carlisle Dispensary.

MRS J., aged 40, of a pale unhealthy aspect, was seized on Wednesday the 11th of February with acute pain of the inner part of the elbow, attended with a diffused redness and swelling, extending downwards along the ulnar aspect of the forearm. On Thursday, when I saw her, these symptoms were more urgent and distressing. She had passed a sleepless night, complaining of shiverings, restlessness, and general febrile disorder. She was ordered purgative medicines, with leeches and repeated warm fomentations to the inflamed part. The disease, however, continued to increase rapidly, both in severity and extent, until Friday morning, when she was visited by myself and Mr Anderson. We found the limb greatly swollen, tense, and unyielding, of a bright red colour, and exceedingly hot. The swelling extended along the inner surface of the arm, from about two inches above to three or four below the elbow-joint, occupying at the same time at least two-thirds of the circumference of the limb. The absorbent vessels on the inner part of the arm which, previous to this attack, had been slightly inflamed from the irritation of a scratch, were now also a little hard, and enlarged, but not particularly painful.

It was clear that nothing but free incisions through the substance of the inflamed part, as recommended by Mr Copland Hutchinson and Mr Lawrence, could now be of any avail in arresting the progress of the inflammation, and preventing subsequent suppuration and sloughing, unless we chose to adopt Mr Higginbottom's new practice for the cure of external inflammations,—the application of the nitrate of silver. Having witnessed the efficacy of this latter remedy in several cases of inflamed absorbents, treated by Mr Earle at Bartholomew's Hospital, in London, I resolved, with the concurrence of Mr Anderson, to give it a fair trial in this instance. I accordingly applied it freely over the whole inflamed surface. In the evening, when I again visited her about eight hours after the application, she was considerably relieved, the tense swelling of the part was a little diminished, and, in fact, the state of matters was so much altered, that when the arm was elevated and at rest, little or no pain was experienced. On Saturday, the parts cauterized continued to improve, but the inflammation had extended beyond the part primarily affected, rendering a second

application of the remedy necessary. On Sunday, she was much better, but not altogether free from pain. The parts first touched with the caustic had vesicated, and in some places had burst, discharging a watery fluid. On Monday she was quite well, and could bear pressure on any part of the arm without experiencing uneasiness. She had passed a comfortable night, and was free from all febrile disturbance. The blackened cuticle had begun to separate, and on the Saturday following had all peeled off, the arm having been affected only with occasional itching during the desquamating process.

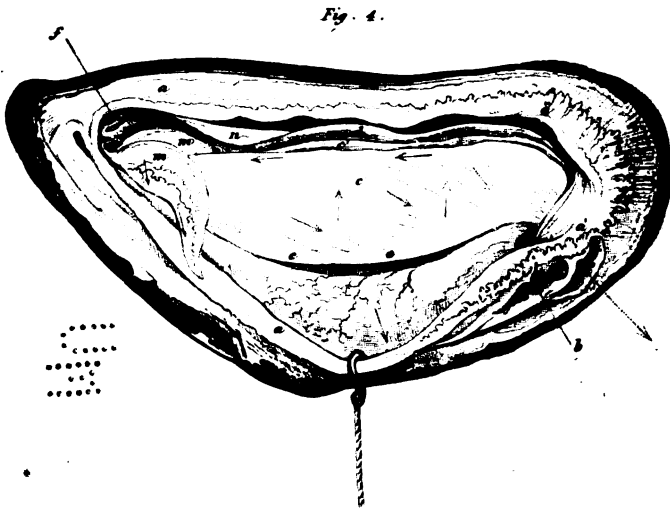
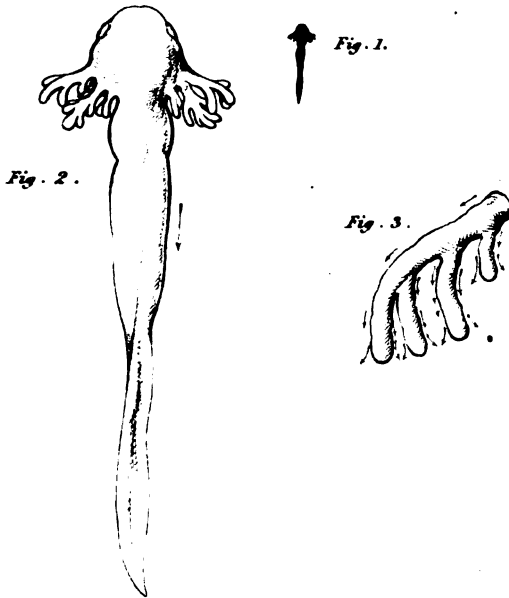
I am induced to publish this case, first, because I think the treatment pursued, which has been lately recommended by Mr Higginbottom, is one of very great practical utility; and, secondly, because I believe it has not, in this part of the country at least, sufficiently attracted the attention of the profession. I have used the remedy in other cases of external inflammation, in phlegmon for instance, and invariably with the same satisfactory result. It has always appeared to me when applied sufficiently early to prevent the formation of matter, or when not resorted to until suppuration had already commenced, to lessen materially the size of the abscess, and enable it to heal more kindly than one would otherwise have been led to expect. I have used it also in a case of numerous minute ulcerations of the leg, which were evidently extending by the process of ulcerative absorption. It formed an adherent eschar over the ulcerated surface, under which the ulcerative action was arrested, and the restorative process established and speedily completed.

As in the case related, I have generally observed the inflammation to extend beyond the part primarily affected, after the nitrate of silver had been applied,—a circumstance which, I think, might be prevented by following the direction of Mr Higginbottom, to apply the caustic over some distance beyond the part actually inflamed.

Should this remedy be found, by further experience, to possess the same power over inflammation of veins, (a rare but extremely dangerous affection,) which I have seen it in several instances exert over that of the absorbent vessels, it must be regarded as one of the most valuable improvements in modern surgery.

From these and other facts already recorded, no reasonable doubt can be entertained of the nitrate of silver possessing a controlling power over external inflammation. I may also add, we have reason to believe, that, if this new remedy be applied to a part about to take on inflammatory action, the establishment of that process will be effectually prevented.

The terrible effects of punctured wounds, which are often



Linear Suture

followed by inflammation and all its injurious consequences, have by this means been prevented or moderated. It has long been an application of acknowledged power in punctured wounds received in dissection, and in other circumstances, which are frequently followed by consequences so direful, as to induce an almost general belief in the operation of some poisonous agency. In such cases, it has been supposed to act by destroying or decomposing the poison introduced into the wound ; but I believe its action may now be more rationally accounted for, by its specific influence in preventing and controlling inflammatory action. It has also been long known as a useful remedy in chronic inflammation of the eye, ulcers of the cornea, and those morbid productions of the conjunctival lining of the eyelids, termed granulations. Here, likewise, I conceive it would be nearer the truth to ascribe its "*modus operandi*" to the same specific influence, than to its stimulating property producing an increased contractility of the capillary vessels, and thus restoring them to their natural actions in the first and second cases, or to any chemical agency on the diseased productions, the result of inflammatory action in the third. Because, from the latter view of the subject, we would be led to expect not unfrequently the supervention of acute inflammation, instead of the restoration of natural action,—an occurrence, which I believe has seldom or never been observed to follow the application of the nitrate of silver. I call it a specific influence, because I know not how to explain its action. The fact of its power, however, is on this account no less certain ; and that it extends to a considerable depth beneath the superficies on which it is applied, is abundantly evident. The power of mercury in arresting the progress of syphilis was never doubted, although its "*modus operandi*" was long unknown, and is still involved in conjecture. The influence of the same remedy over affections of the liver, with a total ignorance of its mode of action, was nevertheless believed as firmly, and acted upon as confidently, as if it had admitted of all the certainty of mathematical demonstration. Why, then, should we hesitate to allow the nitrate of silver that rank in therapeutics, for which abundance of evidence has established for it as just a claim ?

ART. X.—*On a peculiar motion excited in Fluids by the surfaces of certain Animals.* By WILLIAM SHARPEY, M. D.

IN the course of some investigations on the development of the tadpole in which I was lately engaged, I was accidentally

led to observe, that the surface of that animal possessed the power of exciting currents in the water contiguous to it, in a constant and determinate direction. This fact, while it was a curious circumstance in the history of the animal in question, appearing to me at the same time of considerable importance in a general point of view, I was induced to inquire how far appearances of the same kind existed in the rest of the animal kingdom. I was aware that many infusory animalcules and zoophytes had been observed to produce currents in the water exterior to their surface, and that in the sponge, as was first satisfactorily shown by Dr Grant, the water is carried in a uniform direction through certain canals in its interior; but in prosecuting the subject I have ascertained that phenomena more or less analogous are exhibited by extensive tribes of animals of a more perfect structure, in which, to the best of my knowledge, nothing similar has hitherto been observed. Although still occupied with the investigation, yet, as the facts I have already made out are, so far as I know, in a great measure new, and appear to me to lead to conclusions of importance, I think it right in the meantime to give some preliminary account of them; intending to resume the subject at greater length on a future occasion.

The larva of the frog, for some time after its exclusion from the egg, has certain small appendages on each side of the head, to which various uses have been assigned by naturalists, but which are now known to be organs of respiration, and are called the external gills, to distinguish them from the internal gills, by which the animal respire at a later period. Of these appendages there are three on each side, the two anterior of which are larger than the posterior, and consist each of five or six branches diverging from a common trunk, which is attached to the body of the animal. The blood circulates through them in a single stream, which passes outwards to the extremities, where it is bent back, and returns in a contrary direction.

Being desirous of ascertaining the dimensions of the globules of the blood at this period, I happened to cut off one of the external gills as the readiest mode of attaining my object, and laid it on a glass micrometer with a drop of water. On viewing it then with a lens, my attention was attracted by a very singular and unlooked for appearance; the globules of blood which had escaped from the cut part of the gill were moved rapidly along its surface towards the points of the branches in a constant and uniform manner. On further inspection I soon satisfied myself that the blood globules were entirely passive in this phenomenon, and that other light particles brought near to the surface of the gill were moved in a similar manner; their motion being manifestly owing to a current produced in the water along the surface of the gill, in a determinate direc-

tion. A conclusive proof of this was afforded by putting the gill which had been cut off into a watch glass with a little water. Here, when it happened to be fixed against any obstacle, small bodies in its vicinity were moved along it as before towards the extremity of the branches; but when unimpeded, the gill itself advanced through the water in a direction contrary to that in which the particles were moved, the trunk being turned forwards; the tendency to produce a current in one direction thus causing the gill, now no longer fixed, to move in an opposite one. The current commences at the root of the gill and runs along the branches, at the points of which it does not continue its primitive direction, but is turned off sideways and immediately ceases.

I soon found that the gill was not the only part of the animal which excited motions in the water. Nearly the whole surface of the body produced the same effect. A general current commenced on the fore part of the head, proceeded along the back and belly and the two sides, to the tail, along which it then continued to the extremity. It was not so strong as that on the gills, but agreed with it in other respects.

The power of giving rise to the currents, whatever may be its nature, is confined entirely to the external surface of the animal; portions of the skin being removed and put into water in which a powder was diffused, the particles of powder were moved along the external surface only. Parts detached from the animal continue to excite currents for several hours after their separation, and the smallest portion produces this effect. In these cases the current moves always in the same direction with respect to the surface of the detached parts, as it had done previously to their separation.

I continued for some time to observe this phenomenon in the larva of the frog, in order to find out whether it underwent any alteration in the progress of the development of that animal. It is known that after a time the external gills become covered by a fold of the skin, and inclosed in the same cavity with the internal gills, where they gradually shrink and ultimately disappear. When this change is effected, the animal respire by the internal gills, the water entering the branchial cavity at the nostrils and escaping from it by an opening on the left side. On examining it while this change was taking place, and for some time after, I found that the power of exciting motions in the water underwent little or no alteration. The external gills, after their inclosure, still retained their peculiar property, and continued to do so as long as any trace of them was visible; the current on the body remained the same; on the tail it had acquired a twofold direction, diverging from its middle part, or the continuation of the vertebral column, obliquely upwards and downwards towards the upper

and lower edge. As the animal advanced in growth, however, the currents gradually disappeared over the greater part of the surface, continuing longest at the posterior and lateral part of the body ; at length, when the posterior extremities were so far advanced that the thigh and leg, and the division of the foot into toes could be discerned with a magnifying glass, which is the latest period I have made any observation, the current existed only at the commencement of the tail, and on a small part of the surface of the body adjacent to the hind leg.

The internal gills, though tried in various stages of development, never produced any current.

Whatever might be the cause which more immediately gave rise to these currents, it appeared to me that the purpose for which they were intended, was to effect a renewal of the water on the respiratory surfaces ; respiration being performed in this animal not only by means of the gills, but very probably also by the general surface of the body. It was, therefore, not unreasonable to presume, that similar phenomena might be exhibited by the larvæ of other Batrachia, by the Proteus, Siren, &c. and perhaps other tribes of aquatic animals, particularly those in which the respiratory organ was unprovided with a muscular apparatus, capable of causing a renewal of the water on its surface. I have, accordingly, found currents in the larva of the newt, in the Mollusca and other invertebrate animals, and to a greater extent, indeed, than I at first anticipated.

I first examined the larva of the newt or water salamander, a few days after its exclusion from the egg. The external gills at that time consist of three appendages on each side, the posterior and middle of which have each two short lateral processes, the commencement of branches. The anterior extremities appear as a simple protuberance on each side of the spine, a little behind the gills. The heart can be distinctly seen pulsating on the under surface, and the blood in it is of a red colour. The circulation of the blood can be perceived in the gills, the tail, and on the abdomen, on the under surface of which a large vessel collects many collateral streams and returns towards the heart.

At this period the surface of the animal produces currents agreeing in almost every respect with those which take place in the larva of the frog at a corresponding stage of its development. Particles of powder diffused in the water are carried along the surface of the body from its anterior to its posterior extremity ; on the gills they are conveyed along each of the trunks, from the root to the extremity, and apparently with greatest force along the upper and lower surface. The gills also exhibit when cut off the same phenomena as in the larva of the frog, advancing through the water with the cut extremity forwards, in a direction contrary to the currents.

The eggs of the newt being easily procured in every degree of advancement, I next proceeded to inquire at how early a period in the development of the animal the currents are to be perceived. The egg is of an oblong figure, and altogether transparent except the yolk, which is opaque and of a greenish yellow colour, and is surrounded with a quantity of clear liquid. The embryo is formed from the yolk, and is at first of the same colour; it afterwards becomes elongated, and is covered on the back with dark speckles, uniting at a later period into broad stripes.

At the period when I was first able satisfactorily to ascertain the existence of a current, the embryo was but little elongated; the commencement of the gills appeared as a small protuberance on each side, elevated but little above the adjacent surface; the tail did not exist, but its commencement was indicated by the prominence of the spine at its posterior extremity. The abdomen was yellow; the back of a grayish colour, the dark speckles not having yet appeared. When the egg is examined at this period with a lens of high magnifying power, minute bodies may occasionally be perceived floating in the liquid with which the embryo is surrounded. These are drawn towards its under surface, and immediately hurried onwards a short way in a direction towards the tail. The motion, which exists within the egg, may be much more distinctly perceived on taking out the embryo, which, however, requires some nicety, and viewing it in water containing a powdery substance, as in former cases. The current is directed backwards along the under surface of the head and body. It extends only a very short way, and is by no means strong, resembling a good deal what takes place at a more advanced period with parts that have been some time detached from the body of the animal, and, consequently, where the motion has become languid. As the embryo advances in growth, this current gradually becomes stronger, and extends farther back. A lateral current then appears, commencing on each side of the head, and running in the same direction, but not extending so far as the inferior one. At a period somewhat more advanced, but still some time before exclusion from the egg, the animal presents all these appearances in a considerably greater degree.

The next animals in which I have found the power of producing currents, are the Mollusca. Among these it prevails to such an extent, and exists in species differing so much in other respects, as almost to lead one to suspect that it may belong to at least all the animals of this class that respire by means of gills. Indeed I am at a loss to conceive why so general and obvious a phenomenon should have escaped the attention of naturalists, unless perhaps because such as have been engaged in studying these animals have in most cases made their examinations on dead specimens.

In the Mollusca, as in the larvæ of the Batrachia, the currents appear chiefly to serve the purpose of renewing the water on the surface of the respiratory organs ; but, though agreeing in every other circumstance of importance, there is one peculiarity in the Mollusca, which, notwithstanding every endeavour, I have not been able to discover in the Batrachia. The peculiarity consists in this, that the surfaces along which the currents are excited are beset with innumerable cilia, visible only with a glass, which are in constant motion. In this they more or less resemble certain zoophytes and infusory animalcules, in which like cilia have been detected.

The remarkable circumstances attending the respiration of the testaceous acephala or bivalves, first led me to suspect that a property more or less resembling what I had met with in the Batrachia, might also exist in this class of animals. I accordingly began the examination with the common muscle, and, though I subsequently found the same property in others of the acephalous and gasteropodous Mollusca, yet, as I have observed the phenomena with most attention in the muscle, and, as it can be easily procured by any one who is desirous of inspecting the appearances in question, I shall confine my description in a great measure to that species alone.

When a live muscle (*Mytilus edulis*) is attentively examined in a vessel of sea water, it is soon observed to open its shell in a slight degree, and about the same time a commotion may be perceived in the water in its vicinity. This is occasioned by the water entering at the posterior or large extremity of the animal, into the cavity in which the gills are lodged, and coming out near the same place by a separate orifice,* in a continued stream. This current is obviously intended for the purpose of renewing the water required for the respiration and nutrition of the animal ; but though it is now a well established fact in the history of the muscle, the mechanism by which it is produced has not, so far as I know, been satisfactorily explained. Some

* It will be recollected, that the respiratory organs or gills of the bivalve Mollusca are in the form of leaves, of which there are two on each side, inclosed between the lobes of the mantle. Between them are interposed what is called the foot and the prominent part of the abdomen, which separate the two of the right side from those of the left. Each consists of two layers, which are made up of vessels set very close to one another like the teeth of a comb, across the direction of the gill, and perpendicular also to the great vascular trunks with which they communicate, which run along the base. In the common muscle, the two layers of which each gill is composed are connected together at its margin, and by a few points of their contiguous surfaces ; but at the base only one of them is fixed, the other terminating at this part by a round unattached border, (fig. 4. c, c,) under which a probe can be passed into the interior space between the two layers. Besides the gills, the same animals are furnished with four triangular laminae, placed round the mouth, which have been called labial appendages, tentacula, or accessory gills, and which probably serve more or less for respiration.

have contented themselves with ascribing it to an alternate opening and shutting of the shell, but as no such motion takes place in the shell except at distant and irregular intervals, it is evident that the constant passage of the water cannot be explained in this way. Others who saw the insufficiency of this explanation, have endeavoured to account for it by assuming peculiar contractions and dilatations of the mantle in virtue of its muscular power, or like M. de Blainville,* have supposed that the triangular labial appendages placed round the mouth excited the current by their constant motion. After meeting with the currents in the tadpole, it struck me that the entrance and exit of the water in the bivalve mollusca might not improbably be owing to a similar cause; and that the surface of the respiratory organs, and other parts over which the water passed, might have the power of exciting currents in it, the combined effect of which would give rise to the entering and returning stream.

This conjecture proved on actual examination to be right. Having cut off a portion of the gill, I found that a current was excited along its surface in a determinate direction, and that it moved itself through the water in an opposite one, exactly as in the case of the tadpole. The whole surface of the gills and labial appendages or accessory gills, the inner surface of the cloak, and some other parts, produced this effect. The currents on the gills are of two kinds. When finely powdered charcoal is put on any part of their surface a great portion of it soon disappears, having penetrated through the interstices of the vessels into the space between the two layers of the gill. On arriving here a part is forced out again at the base of the gill from under the border of the unattached layer, but most of it is conveyed rapidly backwards in the interior of the gill between the two layers, and almost immediately escapes at the excretory orifice, or that from which the general current already mentioned is observed to come out. That portion of the powder which remains outside the gill is carried along its surface in straight lines from the base to the margin, along which it then advances onwards towards the fore part of the animal. As the spaces between the layers of all the gills terminate directly or indirectly at the excretory orifice, it is easily conceivable that the water, penetrating by the entire surface of these organs, may, by their concentrated effect, give rise to the powerful current which is observed to come out from the animal.

On examining a portion of the gills with a powerful lens, I perceived that it was beset with minute cilia, which are evidently instrumental in producing the different currents. Most of them are ranged along the anterior and posterior margin

* Manuel de Malacologie, &c. Paris, 1825. p. 157.

of each of the vessels composing the gills, in two sets, one nearer the surface, consisting of longer and more opaque cilia; the other close to the first, but a little deeper, in which they are shorter and nearly transparent. Both sets are in constant motion, but of this it is difficult to convey a correct idea by description. The more opaque cilia, or those of the exterior range, appear and disappear by turns, as if they either were alternately pushed out and retracted, or were continually changing from a horizontal to a vertical direction. The motion of the other set appears to consist in a succession of undulations, which proceed in a uniform manner along the margin of the vessel from one end to the other. It resembles a good deal the apparent progression of the turns of a spiral when it revolves on its axis, and might very easily be mistaken for the circulation of a fluid in the interior of a canal, more particularly as the course of the undulations is different on the two edges of the vessel, being directed on the one towards the margin of the gill, and on the other towards the base. But besides that the undulations continue to go on for some time in small pieces cut off from the gill, which is inconsistent with the progression of a fluid in a canal, the cilia are easily distinguished when the undulatory motion has become languid. When it has entirely stopped they remain in contact with each other, so as to present the appearance of a membrane attached to the edge of the vessel.

It is very remarkable, that when the gill is immersed in fresh water, both the currents and the motion of the cilia are almost instantaneously stopped.

Such, nearly, are the appearances I have observed in the muscle. There are, indeed, other particulars which could not well be made intelligible in a short description, and which I purposely avoid mentioning here, the object of this paper being merely to give a statement of the phenomena in general, and not to detail the peculiarities of individual cases, which I shall be able to do with more advantage on a future occasion. For this reason, also, I shall content myself with a simple mention of the other animals belonging to this class, in which I have observed the currents. Of the Bivalves, I have examined the fresh water muscle, the oyster, and another species. In the first of these the motion of the two sets of cilia is the same, but as the gills in that animal differ in some points from those of the salt water muscle, I have not yet been able to satisfy myself as to the mode in which the water is conveyed to the excretory orifice. The current on the surface of the gills resembles that of the salt water muscle, except that on the outside of the external gill it is directed from the margin to the base. It is obvious that, in the bivalve mollusca, the property of exciting motions in the water may serve other important purposes besides respiration, and

it is probably in this way that their nutriment is carried to the mouth, and that the ova are excreted, or conveyed from one part of the body to another.

Of the Gasteropodous Mollusca, I have examined species belonging to three of the great divisions in which Cuvier has arranged them, according to their respiratory organs. The *Doris* and *Eolis* of the *Nudibranchiata*, the *Buccinum undatum* and other species of the *Pectinibranchiata*, and the *Patella* and *Oscabrion*, (*Chiton*, L.) which form the two genera of the *Cyclobranchiata*. In all these, I have found like currents along the surface of the gills and other parts of the body, directed in general in such a way as to expose the respiratory surface as completely as possible to the influence of the water.

The only animal among the Mollusca in which I have not been able to perceive a current, is the *Ascidia*, but the observation may perhaps be inconclusive, as the specimens had been some time out of the water. I have not yet been able to procure live specimens of the *Cephalopoda*.

I also found this phenomenon in the *Annelides*; the animal examined was a species of *Amphitrita*, which has the gills in the shape of tapering filaments, placed in two rows along the back. Here the current runs forwards on the back between the two rows of gills, then along the surface of the latter, which are beset with tufts of cilia. In the class of radiated animals, similar appearances are presented by the *Actinia*.

I have not as yet been able to discover any thing analogous in fishes. It seems to me, however, not improbable, that the external gills which belong to the foetus of some cartilaginous fishes, and which have been compared to those of the tadpole, may resemble them also in this particular.

I have not yet extended the inquiry to warm-blooded animals. It is true I have made one or two observations on the chick during incubation, in order to ascertain whether its respiratory process is accompanied at an early period with phenomena like those I have been describing. These trials have hitherto afforded no decisive result. But there are other processes in the animal economy, in which a similar agency may possibly be in operation. Of these perhaps the most striking is the motion of fluids through canals, under circumstances in which it cannot well be ascribed to a contractile power in their coats; but it would be premature to reason further on this subject at present.

The foregoing are the principal facts I have as yet made out. Of the cause which more immediately gives rise to the phenomena, I am not prepared to offer any satisfactory explanation. It might be supposed that, in most of the invertebrate animals,

the motion in the fluid is produced by the mere agitation of the cilia. The operation of these, however, is probably not entirely mechanical, because, though I have closely examined the gills of the tadpole with a lens of less than the twentieth of an inch focal distance, I have never been able to detect cilia on any part of their surface. The currents, moreover, take place in the embryo of the Batrachia at a period when the extreme simplicity of its structure renders the existence of cilia highly improbable, and it is not likely that phenomena, agreeing so much in other respects, are owing to different causes; but whether they are to be referred to any of the known properties of living bodies, or to a peculiar power residing in the parts, is a question which in the meantime I would merely submit to the consideration of physiologists, without venturing to give any decided opinion.

In conclusion, I may mention that most of these observations have been several times repeated. The phenomena observed, are for the most part sufficiently obvious, some being visible with the naked eye, and almost all with a lens of moderate power. I have shown them to several of my friends, among whom I may mention Dr Thomson, Mr Syme, and Mr Allen Thomson, to the last of whom I feel much indebted for his obliging assistance in various ways, in the course of these inquiries.

31st May 1830.

EXPLANATION OF THE PLATE.

Fig. 1. The larva of the frog a few days after coming out of the egg.

Fig. 2. Magnified view of the same.

Fig. 3. Plan showing the direction of the currents on a portion of the gill.

Fig. 4. The common muscle viewed from the right side; the right half of the shell having been removed, and the mantle turned down to show the parts within.

a, a, a', a'', The circumference of the mantle or cloak; between *a'* and *a''* it is fringed with tentacula or cirri, and it is nearly in this space that the water enters, the borders being usually contiguous in other parts.

b. The posterior muscle which closes the shell, partly concealed by the reflected edge of the cloak. Between *a'* and *b* is seen the opening by which the water issues.

c c'. The two gills of the right side; *d*, one of those of the left. The dotted arrows mark the course of the water that has been forced through the interstices of the vessels into the interior of the gill. The dark arrows indicate the direction of the external current, which perhaps serves also to clear the surface of the gill from foreign matters, and convey nourishment to the mouth.

c c. The free edge of the unattached layer; under it is seen the opening where the water sometimes escapes from the interior of the gill, and through which a probe can be passed between the two layers.

f. The extremity of the foot, or the tongue as it is sometimes called.

m, m. The two labial appendages or accessory gills of the right side; *n*, one of those of the left. Between them and before the foot is the opening of the mouth, which cannot be seen in the figure.

PART II.

CRITICAL ANALYSIS.

ART. I.—*Illustrations of some of the principal Diseases of the Ovaria, their Symptoms and Treatment; to which are prefixed Observations on the Structure and Functions of those parts in the Human Being and in Animals.* By EDWARD J. SEYMOUR, M. D. Fellow of the Royal College of Physicians of London, and one of the Physicians to St George's Hospital. With 14 Lithographic Engravings. London, 1830. 8vo, pp. 126.

THOUGH numerous examples of disease of the female ovaries have been recorded by various observers, nothing has yet been done to exhibit a general view of the subject; and most of the facts recorded remain in an insulated shape, as individual monuments of ovarian disease, without general principle or attempt at classification, and without endeavour to investigate the circumstances on which their origin and developement depend. Such may be said to be the character of the cases given by the first Monro in the Edinburgh Medical Essays, those scattered through the Philosophical Transactions, the cases given by Cheston in his Pathological Inquiries, the case by Mr Ford in the 2d volume of the Medical Communications, those by Mr French, Dr Pulteney, and Dr Sayer Walker in the Memoirs of the Medical Society, one by Dr Cuthbert Johnson in the Medical Commentaries, and several in the Medico-chirurgical Transactions. As simple records of pathological facts, these cases possess some value, and are creditable to the industry and observation of the authors. But it says little for the philosophical spirit of the physicians of this country, that they have been suffered to remain so long in this state, without being applied to their legitimate purpose, of illustrating the general characters and formation of ovarian disease.

Dr William Hunter, indeed, in his instructive paper on the cellular membrane, gave some general views on one form of ovarian disease, that named dropsy,—the result of the dissec-

tions which had at different times fallen under his observation ; and Baillie long afterwards gave the substance of his observations derived from the preparations of the Hunterian Collection. But it is no injustice to the memory of these distinguished persons to say, that these were mere sketches, calculated to excite rather than gratify inquiry, and that, however valuable they may be as literary curiosities, they are of small moment to the pathological history of these disorders. From the travels of Joseph Frank, who visited this country in 1801, we learn that Dr Cheston of Gloucester had in contemplation a work on the morbid states of the female ovaries ; and to those who are acquainted with the inquiries of this author, it is superfluous to say how well qualified for the task he must have been. Dr Cheston, however, died without having accomplished his purpose, or leaving, so far as we know, any memorials of his progress ; and the duty of elucidating the subject of ovarian disease has thus been left to subsequent observers.

The present may be therefore regarded as the first attempt to exhibit a systematic view of the subject ; and if it be less extensive and complete than the pathologist may have reason to expect, it must not be forgotten that the author adventures in a new and uncultivated field, and that he has thought it proper to confine his inquiries chiefly to the facts which have fallen under his personal observation.

The necessity of previous knowledge of the structure and functions of most of the organs to the study of their morbid changes, is a point pretty well agreed on ; but there are few, perhaps, in which the necessity of this information is more conspicuous than in those of the ovarium. So many of the multifarious morbid changes incident to that organ are more or less intimately connected with the sexual developement at the age of puberty, or with the phenomena of impregnation, or even with those of menstruation probably, that it is almost impossible to overlook the relation which subsists between the sound and morbid structure, and the normal and abnormal actions of these bodies. Dr Seymour, therefore, undertakes a task by no means superfluous, when, in the outset of his inquiry, he devotes a chapter to the exposition of the structure and functions of the ovaries, not only in the human subject, but in the classes of the vertebral animals generally.

The principal object of the author in this exposition, is to establish the inference, that the ovarian vesicles discovered by De Graaf, Van Horn and Steno, are quite analogous to the *ova* of fish, amphibia, and birds ; that they exist previous to impregnation, and are not the result of that process ; and that the *corpora lutea* which they form, though occasionally taking

place without impregnation, are much more frequently the result of that action. The opinion of De Graaf is known to be, that the formation of these bodies is the result of the impregnating action on the ovarian vesicles, which he imagined to swell after sexual connection, and, bursting the peritoneal and proper coat, to be conveyed by the Fallopian tube into the cavity of the uterus. This opinion, however, was disproved, first by Malpighi, who saw *corpora lutea* in the ovaria of calves, and recent *corpora lutea* in the ovaria of cows, in which one foetus only was contained in the uterus; and afterwards by Valisnieri and Santorini, who is well known, by those familiar with his writings, to state, that he had witnessed and demonstrated *corpora lutea* in the ovaries of virgins, and to infer, therefore, that they are neither excited nor matured by the sexual act. It is indeed an interesting fact, that Santorini, whose accurate researches distinguish him as the first anatomist of that period, anticipates Sir Everard Home in this idea, and advances several ingenious notions regarding the ovaries, and the influence which they exercise on the health of the female. These facts, with others observed by himself, induce Dr Seymour, notwithstanding the authority of Haller, to regard the original opinion as well-founded, that *corpora lutea*, though certainly formed after impregnation, may also be formed, and occasionally are formed, without the intervention of that process; and, therefore, that the existence of *corpora lutea* does not imply preliminary impregnation. Dr Seymour has observed, as others have already done, the ovarian vesicles several years before puberty, and remarks the enlargement and augmented vascularity which these bodies undergo at that eventful period. He admits that this enlargement may proceed the length of bursting the ovarian peritoneal coat, and the proper vesicular tissue; and he seems inclined, with Santorini and Sir Everard Home, to impute this phenomenon to the operation of the moral feelings of the individual, (p. 30.) The cases in which, with several *corpora lutea* in the ovaries, one foetus only has been found in the womb, Dr Seymour infers, prove merely that several vesicles have burst, but that one only has been fecundated;—in short, that the tumefaction, eruption, and escape of the ovarian vesicles, though a certain consequence of impregnation or fecundating intercourse, may nevertheless take place independent of this event.

In the second chapter of his treatise, Dr Seymour proceeds to consider the diseases of the ovaries under three heads;—those which arise from inflammation of the ovarian tissue—those which arise from simple enlargement of the natural structure, and those which depend on the accession of new matter;

and, thirdly, congenital alterations and diseases proceeding from obstruction of the function of the ovaries.

Under the first head the author ranks inflammation of the ovaries occurring in puerperal females; softening succeeding to acute inflammation; chronic inflammation of the ovarian filamentous tissue, terminating in the formation of purulent matter; abscess of the ovary, and chronic inflammation, terminating in thickening and enlargement of the organ.

On the subject of inflammation affecting the ovarian vesicles, the following extract will show the opinion of the author:

“ Whether the Graafian vesicles are ever affected by inflammation, except when in common with the substance of the ovarium, it would be impossible to determine, except by long-continued and very accurate examination after death. We meet, indeed, in authors, with accounts of the ovarium which has been inflamed having purulent matter of a healthy character contained in cysts; but no allusion is made to whether this arises from inflammation or supuration of the vesicles, or is circumscribed abscess in the cellular structure. It is still more difficult to say what is or would be the effect of inflammation of the corpora lutea; that is, of vascular excitement greater than what is necessary for their formation; for their formation may be said to be owing to increased action of the vessels of the part. We have seen that they form in some cases after rupture of the vesicle, independent of impregnation, and that such rupture is occasioned by excited feelings connected with the generative system: hence it is reasonable to expect that any morbid affection of the ovaria dependent on such excited feelings, would have their origin in the corpora lutea. But authors who have hitherto written on this subject have been contented to describe vaguely the appearances, without reference to peculiarity of structure; and in the numerous cases on record in which the ovaria were altered in structure, in conjunction with the terrible disease termed *furor uterinus*, no further information is to be gained than that purulent matter or puriform fluid was found on cutting into the ovarium. The coats of the vesicle, however, in advanced life, undergo remarkable thickening; and instead of containing fluid, are filled with a thick matter of a red colour, from the presence of vessels, sometimes nearly solid, at others of a thinner consistence. This change exhibits on a small scale some of those hard tumours which are sometimes found in the parietes of an ovarian cyst. Is it not possible that these may be some of the superficial vesicles, having undergone the change alluded to, and magnified by disease?” Pp. 41-43.

In these observations Dr Seymour shows a degree of scepticism which is at least commendable, in avoiding positive assertions regarding the nature of inflammation of the vesicles and the concomitant circumstances. Great uncertainty, and no small degree of fallacy, attends all speculations regarding the influence of mental emotions on the corporeal organs, or the reaction of

the latter on the former; and in the case of the female ovaries the subject is involved in peculiar ambiguity. Several facts, nevertheless, show, that there are examples of disease occurring in these organs, much short of *furor uterinus*, in which the organization of the vesicles may be so changed as to lay the foundation of several immedicable diseases. It was the opinion of Santorini, not only an able anatomist, but an accurate and sagacious observer, that the vascular orgasm, occasionally developed in the vesicles, was the cause of those multifarious and proteiform maladies to which the sex are liable, and that in the persons both of virgins and of those in whom intercourse had been imperfect, these consequences were most serious, and attended with most pernicious effects on the health of the parties. His sentiments on this point are so distinctly expressed that it would be injustice not to give them in his own terms:

“ Id ego non adeo tantum commemoratum volui, ut quisque evidenter cognosceret, non tanta eam circumpositam membranam firmitatē esse, quam vel suis porulis hiare plurimum, vel etiam, ubi id requiratur, dehiscere atque diduci pro re nata possit: sed et ab enormi aliquando hujusce distractione propter conclusum tumensque, modo unum, modo geminum, sive in virginibus, sive in mulieribus luteum corpus, tanta illa excitari symptomata, quæ et grave clinicis, et multo gravius laborantibus negotium creant. Hinc fortasse repetendum est, quod nostræ sequioris sexûs, quibus vel laudabiliter per decus vel pie sancteque per religionem viros adeundi adempta facultas est, brutorum femellis exceptis, tot sint obnoxie morbis, quos nedum elidere, sed nec probè dignoscere medicus valeat. Igitur vel ob minus distractilem ac plus æquo prementem circum ovarium membranam, vel ob distractam nimium, ac pene discissam, ex eis partibus misellis mulieribus morborum ilia des progigni nullus dubito. Nam in quibus firma nimium præsepiens membrana est quo minus tumenti luteo corpori locum cedat, id morborum genus exoriri censeo, quod cuidam humorum inertie medici tribuere solent: quibus vero valida ea est ac tanta tamen conclusi ac adolescentis lutei corporis virtus sit, ut vel incommode eam explicare, vel gravius diffringere queat, eæ inde progerminant distensiones, quibus miris, multisque modis miscræ sive nulli sive male copulatæ viro cruciantur. Nec nobis id *semel observasse contigit*; sed quum neque hujus loci sit, neque temporis ea recensere, quæ ad aliquod fortasse opus distulimus, hæc sit interea memorasse satis.” *

The other work to which these observations were to be consigned, Santorini lived not to accomplish; so that we are ra-

* Observat. Anatom. cap. xi. sect. xv.

ther in the dark as to the exact nature of the changes to which he here alludes ; but the foregoing statements furnish sufficient testimony that he had good reason for associating various symptoms in the living body with derangement in the organization of parts, with which his anatomical knowledge rendered him familiar, and which, for want of that anatomical knowledge, other physicians erroneously imputed to *inertia* of the fluids.

But if this department of the subject has been left unexplained in its details by Santorini, it is due to Dr Seymour to say, that he adduces several facts which tend to illustrate the truth of these views. The change which this author remarks in the fluid contents of the ovarian vesicles from admixture with blood, or rather we should say, from change in its secretion, is manifestly to be ascribed to a morbid state of the vessels of the inner membrane, induced in all probability by the sexual act,—in consequence of which they secrete, not the natural sero-albuminous fluid, but a morbid one partaking of the qualities of the circulating fluid. Thus, he gives a case in which a married woman of 31, who, after being under treatment for disease of the heart, on returning home had intercourse with her husband, and six weeks after was cut off suddenly, and in whose right ovary was found a bladder or vesicle the size of a large pea containing serous fluid, and at the point of union with the ovary, a breach or fissure in the substance, as if it had burst the ovarian coat. This, Dr Seymour ascribes to a bursten vesicle imperfectly fecundated, and not completely detached from the ovary.

The morbid change, however, which seems to depend chiefly on the vesicles, is the conversion of the ovaries into several, sometimes numerous cysts, containing fluid varying in colour and consistence,—a disease which has been absurdly enough named dropsy of the ovarium. Of this change, the first good general account is given by William Hunter in the following terms. “When there is one cyst, it generally, if not always, contains a thin water. When there are many, some of them more commonly contain ropy fluid, in consistence like gall or thin honey ; and others a gelatinous substance. The thin water is usually clear, the ropy fluid of a dark brown colour, and the jelly something less clear and transparent than the white of an egg. Sometimes it is mixed with opaque white parts ; sometimes it is of an amber colour ; and at other times it is dark and brown.” He afterwards states, that he never found the dropsical ovarium truly scirrhus, as had been vaguely asserted by some, and that the structure proved on dividing it to be “a compact group of small bags, or a spongy substance filled with jelly.”

To much the same effect is the observation of Mr Paisley,

of an ovarium composed of many small bags of different sizes, containing glairy matter like mucilage or honey,—that of the first *Monro*, of one containing many vesicles of different bulk, distended with mucus, or with firm steatomatous substance, and some of the sacs containing both mucus and steatom,—the case of *Dr R. Pulteney* in the second, and that of *Dr Sayer Walker* in the fifth volume of the *Memoirs of the Medical Society*,—that of *Dr Cuthbert Johnson*, and those of *Mr Chevalier* and *Dr Merriman* in the third volume of the *Medico-Chirurgical Transactions*. In all these cases the ovarium was converted, more or less completely, into a mass of serous or sero-sanguine cysts, varying in size and number; and, in general, the original shape and appearance of the organ were more or less altered, and its proper texture destroyed in proportion to the size and number of the cysts. When this has proceeded to its greatest extent, the original tissue of the ovary is completely removed; the shape of the organ can no longer be recognized; and in its place are substituted one, two, or more cysts, large in the first case, small in general, when numerous.

If any doubt can be entertained on the origin of these and similar cysts from the ovarian vesicles, it may be disproved by tracing the appearances which the disease presents at different stages of its progress. This we expected to find done by *Dr Seymour*; but he seems to regard the point as abundantly established without this species of demonstration, and confines himself simply to explain the mechanism of the single large cyst.

“The first form of this disease, and the simplest, is from an enlargement or alteration of the corpora Graafiana. At an advanced period of life, on cutting into the ovarium, one or more of the Graafian vesicles are found dilated; and these bodies, generally the size of a millet-seed, becomes as large as an almond, are filled with limpid fluid, and their internal membrane becomes very vascular. Such is a common appearance; but occasionally they enlarge to a greater degree, and always on the side nearest the proper coat, which becomes distended often to an enormous size. In this way, it appears to me that a large single cyst with a fibrous covering may be formed; and this is the simplest form of ovarian dropsy, the internal membrane secreting a prodigious quantity of fluid.” Pp. 45, 46. This opinion he corroborates by the authority of *Cruveilhier*; and, indeed, it is not only the general, but the most probable opinion. The case of two or more cysts is attributed to the enlargement of two or more vesicles.

In illustration of the general mode in which this conversion takes place, *Dr Seymour* gives the following instance.—“A married woman, æt. about 60, was admitted into *St George’s Hospital* in September 1828, in order to undergo the operation of tapping for the third time in five years, rendered necessary in consequence of the sufferings she experienced from the pressure of the

tumour. About sixteen pints of ropy albuminous fluid, of a chocolate colour from admixture of blood, were drawn off. The patient whose health was much broken, did not rally after the operation : and she died, as is often the case, not from inflammation occurring after the operation, but with symptoms of exhaustion, a week from its performance.

"On opening the body, a large fibrous cyst was visible, pushing forward the broad ligament as far as the fundus of the uterus ; and on the opposite side expanding into a sac, which reached nearly to the epigastrium, and contained several pints of coffee-ground fluid. At the inferior part of this sac were the remains of the ovarium, very much shrivelled and imperfect on the surface internal to the cyst. It appears to me that this is a specimen of the cyst which I have endeavoured to describe ; an enlarged vesicle, such as we so often see in its earlier stage, pushing forward and gradually dilating the fibrous coat of the ovarium, the remainder of the ovarium remaining attached to the inferior portion of the cyst.

"It is to this form that the name encysted dropsy may be strictly applied, and is the disease which exists so many years without much distress, furnishing, by paracentesis, such a wonderful quantity of fluid. A patient of Mr Keate's, in St George's Hospital, in the autumn of 1828, was tapped for the fourth time in three years, and lost seventy-five pints of fluid. She is now alive. But this quantity is trifling compared with the two well known cases on record, one related by Dr Mead, and the other by Mr Martineau, of Norwich ; on both of which authorities we can rely.

"In the first, the case of Lady Page, the patient was tapped sixty-seven times in five years and a half, and lost 1920 pints of fluid. The second, the case of Sarah Kippus, detailed by Mr Martineau ; in twenty-five years the patient lost by tapping the incredible quantity of 6631 pints of fluid." Pp. 46-48.

"Much solid fibrous structure is occasionally connected with these collections of fluid ; but this form of disease will more properly be considered under the head of malignant disease of the ovarium.

"The ordinary symptoms attendant on ovarian dropsy are very various, and by no means severe, and are limited principally to the effects of pressure on neighbouring parts. Where the increase of the disease is slow, the patient often suffers no other inconvenience than from swelling of the leg on the side on which the tumour is largest, or from the unsightly bulk of the abdomen, which she is unable to conceal. Patients have lived in this manner thirty or forty years, with a very considerable enjoyment of the comforts of life, and even the pleasures of the world, the accumulation of fluid rendering it necessary from time to time to perform the operation of paracentesis. In cases of this kind, symptoms dependent on unusually rapid increase of bulk, or pressure on any particular organs in the abdomen, occur. Thus heartburn, vomiting, and purging, difficulty of passing urine, or violent and severe headach, are met with, which are entirely removed if the bulk of the tumour be reduced. There is a case now under the care of Mr North, of Berke-

ley-street, where the patient has for many years been unable to pass her urine, except by the daily use of the catheter; and this appears to arise from the natural situation of the bladder being altered by pressure, and perhaps by the adhesion of the tumour.

"When both ovaria are diseased in this way, the catamenia are always absent: when only one ovarium is affected, they are sometimes irregular, sometimes absent altogether; but as they continue to occur often throughout the whole course of the disease, in the latter case, when irregular, it is rather the result of secondary constitutional derangement than of the local disease. In many cases the diagnosis of this disease is sufficiently easy. Pain has been felt in either iliac region, succeeded by a tumour, which can be traced low into the pelvis, and the uterus is found on examination dragged upwards by the morbid growth. The history likewise assists us: it has followed miscarriage or delivery; at other times it occurs in females where pregnancy is out of the question, or at a time of life when it is impossible, and yet where the unbroken health renders ascites a very improbable occurrence. Occasionally, however, independently of its complication with pregnancy, it is difficult to distinguish this disease from accretions of the peritonæum with effusion, and still more so from ascites, the result of visceral obstruction; often also it occurs together with ascites." Pp. 48-50.

By far the most important point in a practical view is the inquiry into the pathological nature of the process which produces these cysts and serous vesicles. All authors mostly, misled by false analogy between the external appearance of this disease and that of ascites, have regarded these accumulations as dropsical; and Dr Seymour appears in this instance without much hesitation to follow the multitude. It is needless here to dispute about names, or to draw refined distinctions on the nature of morbid processes, which correct observation shows pass by insensible shades into each other. But, if ever there be a species of dropsy which originates in inflammatory action, it is the ovarian; and if ever this process have the power of accumulating fluid in confined cysts, it is in the vesicles of the female ovary. This conclusion is confirmed by every thing observed regarding enlarged ovaries, and every thing learned from them by inspection after death. Whether the cysts are single or manifold, if their history be traced, it will be found, that invariably they have commenced with symptoms of inflammation. This process, indeed, does not in all instances assume the acute form. It is often chronic, or beginning in the acute form, after speedily running its acute stage, glides into the chronic. The process is seated in the vesicles, and its effect is to produce a new and increased secretion from the inner surface of the membrane. As this fluid increases in quantity, it distends the vesicular membrane, which enlarges at the expence of the ovarian cellular tissue, and the other vesicles. This process is not

effected, as John Hunter would have said, by pressure only. The vessels which in the natural state are distributed to the ovarian tissue and the other vesicles, are, by the establishment of the inflammatory process in the diseased one, necessarily defrauded of their natural supply of blood. The parts to which they go, thus dehematized, shrink and undergo a species of atrophy, the rapidity and extent of which are generally in the direct ratio of the anormal or hypertrophic enlargement to which the single morbid vesicle proceeds. In this manner, after a certain lapse of time, the entire ovarian cellular tissue disappears under a process of starvation, and the vesicles are obliterated or reduced to so small a size, that they can no longer be recognized; while the place of the original structure is usurped by one overgrown cyst, which has derived its excessive size and contents from the spoliation of the others. The process which thus originated in inflammation, terminates, as is almost invariably the case, in hypertrophic augmentation, or excessive nutrition; and it is the duty of the practitioner, in contemplating the latter, never to lose sight of the former.

Of the modes in which the disease may terminate, Dr Seymour mentions, first, that by adhesion of the cyst to some part of the large intestines, destructive absorption of the parietes, and the discharge of much fluid by stool or the vagina; secondly, adhesion of the cyst to the abdominal parietes, and discharge of the contents at the navel, by spontaneous rupture or opening of that orifice; and, thirdly, the discharge of the contents of the ruptured cyst into the peritoneal cavity, with subsequent absorption, or the formation of fatal peritonitis. The termination by absorption Dr Seymour justly regards as difficult to understand, and also as somewhat rare; and probably it would be no breach either of justice or charity to doubt, whether the cases so terminating were really examples of ovarian cysts. The termination by discharge through the vagina, Dr Seymour notices too slightly, in our opinion; for several of the instances of ovarian dropsy which have fallen under our observation, or come within our personal knowledge, have terminated in this manner. In one remarkable instance, indeed, the fluid has three times been discharged by this outlet. Though it is manifest that the Fallopian tube is the channel through which it escapes, it is not exactly demonstrated by what means the fluid passes from the cyst into the tube, unless by accidental adhesion of the former to the superior open extremity of the latter, or by the contents first bursting into the peritoneal cavity, and thence proceeding, as in some examples of ascites in the female, through the uterine tubes.

On the subject of changes in the peritoneal coat of the ovaries, Dr Seymour is very brief. The osseous conversion which originates in the peritonæum, and occasionally passes to the substance, is merely mentioned; but of the latter extreme, he states that no specimens are preserved in the collections of the metropolis.

Of strumous disease, he mentions one instance in the person of a girl of 14, cut off by pulmonary consumption, and who presented, besides disease of the knee-joint, scrofulous abscess in the fundus uteri, and curdy matter in the Fallopian tubes.

On the subject of scirrhus, a term which, in reference to the ovary, he remarks, is very vaguely used, he adduces the authority of Baillie, and a case from Dr Robert Lee, in which, in the person of a woman of 70, who died after long suffering from a tumour in the hypogastrium with ascites, there was found after death in the site of the right ovary a tumour, weighing 7lbs of dense fibrous structure, with large cysts containing fluid, varying in colour and consistence, attached to its upper surface, and the peritonæum thickened and cartilaginous. Ulceration of scirrhus structure in the ovary Dr Seymour regards as very rare, and adduces, as the only well known example, an instance in a preparation preserved in the Museum of the College of Physicians, the section of which exhibits the softening of various parts of its substance into thick brown fetid fluid. It is a good example of the influence of the scirrhus diathesis, that this preparation was obtained from the person of a patient, who died of cancer of the stomach. It is not stated whether its presence and progress were indicated by symptoms during life.

The next subject examined by Dr Seymour is that of malignant or fungoid disease of the ovary. The first of these terms is too vague, and is equally applicable to scirrhus as to the variety of disorder under review; and from the language subsequently used by Dr Seymour, he appears to consider it as analogous to cancer. This confusion, we think, it might have been easy to avoid by using some obvious characters to distinguish scirrhus and cancer, which are certainly different stages merely of the same disease, from the fungoid disorganization, which the author here undertakes to describe.

According to the observation of Dr Seymour, this disease takes place under two forms. The first is that of a group of numerous cysts, with contents more or less fluid, occasionally with an admixture of bony or earthy matter, often a fatty substance like lard, sometimes penetrated with long fine hair without bulbs, more frequently filled with albuminous matter, varying in colour and tenacity. In some instances these contents resemble gruel,—in others they are dark or sooty-like,—in others

mahogany-coloured, and occasionally brownish and opaque, like Griffith's mixture, (reddish-brown, inclining to umber brown.) To the second form, Dr Seymour refers the case of a single large cyst springing from the ovary, and containing tumours varying from the size of a pin-head to that of an orange, which are divided by white bands into smaller cysts, all containing semi-fluid gelatinous matter.

It must be regarded as a proof of the disadvantage of not defining accurately the physical and anatomical characters of these changes, that the author, after the foregoing statement, acknowledges the difficulty of determining whether the first of these varieties is entitled to the character of malignant or not. The characters are unhappily neither fully nor very accurately given; and we, therefore, feel the impropriety of using positive language. But, so far as they go, we think they afford sufficient proof that the author has referred to the head of malignant productions, several which have at least a doubtful title to that character. The presence of bony or earthy matter is by no means a proof of malignancy, that is, of incurable destructive ulceration. Still less so is the adipose or lardaceous deposit in all instances, with or without hairs, malignant. The soot-like or fuliginous deposition is certainly the melanotic; and even the mahogany, and deep-brown, or umber-brown coloured deposit, may be varieties of the disease ascribed to simple enlargement of the various cysts. It is, indeed, not so much from the nature of the contents of these cysts at any given time, as from the progressive changes which they exhibit, that their true character can be determined; and it would have been highly desirable, if Dr Seymour had availed himself of his opportunities to decide this question, or placed those which were still doubtful in a separate section.

The second variety, which is less equivocal in character, Dr Seymour refers confidently to the head of malignant or fungoid disease; and he justly remarks, that, if doubts were entertained on its real nature, these must be removed by the circumstance of its occurrence in combination with similar malignant disease in other organs.

"The malignant form of the disease may be recognized during life, by the want of nutrition and broken health of the patient, the unevenness and rapid growth of the tumour, the simultaneous enlargement of glands in other parts of the body, and the occasional occurrence of lancinating pains in the part. The latter symptom is not constant. The pulse is quick and feeble, and, as the disease proceeds, there is hectic fever, and often aphthæ in the mouth, with an inexpressible sense of debility.

"The presence of fungoid disease of the pylorus, mamma, or cervix uteri, together with disease of the ovarium, would place the nature of the latter almost without doubt." P. 63.

The author then proceeds to notice the opinions of Dr Baron and Dr Hodgkin on the mechanism of the formation of tumours and new growths, and to consider how far they are applicable to explain the formation of malignant productions. In this, however, he proceeds rather farther than the former author at least; for whatever may be Dr Baron's ultimate applications of his hypothesis, he has not yet, so far as we are aware, applied it to the formation of cancer, fungus hæmatodes, and medullary tubercles, as Dr Seymour here represents him to do. It is chiefly, if not exclusively, to the tubercles of serous membranes and those of the pulmonic tissue, which are both of scrofulous, not cancerous origin, that Dr Baron has hitherto applied his hypothesis of lymphatic obstruction, and hydatid or vesicular development. The influence of the remote causes, such as confinement and imperfect nutrition, make little or nothing for the proofs of the question, since in different individuals, and under different circumstances of diathesis, management, &c. they produce very different effects. Of the theory of Dr Hodgkin we may probably speak afterwards; but at present must confine our remarks chiefly to the subject at present under consideration.

The characters of this malignant disease of the ovary, Dr Seymour illustrates by the detail of six cases with necroscopic reports. In these cases the symptoms during life were on the whole similar in general character. In all there was distension of some part of the lower region of the abdomen, by a tumour accompanied with much pain, constipation, heavy gnawing pain of the loins, occasionally discharge from the vagina, in some expulsive efforts with the discharge of solid fleshy masses from the same opening, and in general ascitic swelling of the belly. With these local disorders were combined impaired appetite, much thirst and heat, scanty high-coloured sedimentous urine, quick pulse, occasionally, when the disease was far advanced, evening accessions, followed by profuse sweating, and sleepless or very restless nights. Towards the termination of the disease, which is necessarily fatal, the pulse becomes extremely rapid and weak, the mucous membrane of the mouth is aphthous, the stomach is distressed with vomiting and heartburn, the pain of the loins becomes excruciating, and the patient is cut off by acute but consecutive peritonitis from the irritation occasioned by the escape of the morbid contents into its cavity.

Some idea of the ravages occasioned by this disease may be formed by the following description of the necroscopic appearances in the second case.

“ On removing the omentum, the intestines were found much distended with air, glued together by effusion of lymph, and about

three pints of whey-coloured serous fluid in the cavity of the abdomen. The uterus was enlarged, and its fundus situated above the brim of the pelvis, in the left inguinal region: the left ovarium and Fallopian tube sound; the right merged in the tumour. Under the peritoneal coat, near the fundus, several fibro-cartilaginous tumours were found, of a dense structure and yellowish colour. Occupying the right iliac and lumbar regions was a large tumour, with an irregular, and lobulated surface, varying in colour, from a light red to nearly black. It adhered to the caput coli and all the adjacent parts, filling nearly the whole of the pelvic cavity, passing behind the uterus, between the rectum and vagina, forming a projecting tumour in the vagina, pressing the uterus upwards and forwards towards the left side. This irregular mass, when cut into, and which appeared originally to be formed of the right ovarium, presented a great variety of appearance, of which it is difficult to convey an accurate idea. In some parts there were irregular-shaped cavities, containing a soft matter, having the appearance and consistence of brain, in some parts of gelatinous consistence: no part appeared organized or cartilaginous. When the soft matter was washed away, a large mass of fibrous matter, similar to that on the uterine surface, remained. On opening the uterus the os uteri was found entire, but soft and altered in structure: the cavity of the uterus contained a quantity of dark ash-coloured purulent fluid. The whole original texture of the uterus was diseased, a ragged fibrous substance, of fungoid growth, springing from its surface throughout. Several small fibro-cartilaginous tumours seemed growing also from its inner surface. The original fungoid growth which the uterus contained had been expelled from time to time, which afforded momentary relief from the occasionally insufferable pain which the patient endured." Pp. 72—74.

In the third case, in which the disease had completely converted the left ovarium into its own structure, it appeared in the shape of a cyst, with solid walls of white gelatinous matter, containing, however, some brown substance; and from the inner surface of this solid mass projected irregular ulcerated loose portions into the interior of the cyst. In the fourth case the right ovary was changed into a mass of brown-like matter, rather fluid, and arranged in cysts, one of which having given way had discharged its contents into the peritoneal cavity, and thus, by inducing acute inflammation, proved the immediate cause of death. In the fifth case, the principal tumour consisted of a dense cyst, irregular in its inner surface, and containing about six pints of thick white fluid, resembling urine in odour, at the bottom of which were several masses of soft white unctuous substance, exactly like fresh butter, amounting to about eight ounces, and enclosing a mass of soft matted hair, four inches long, and two and a-half broad.

Dr Seymour concludes this part of his work with some short notices on imperfect fetuses, masses of hair and adipose mat-

ter, and bones or teeth found in the ovaries. Of these, it is well known, that numerous cases are recorded; and the author refers to these cases chiefly with the view of considering the question, whether they are to be regarded as imperfect conceptions, formed at the same time with the being in whom they are found, and therefore derived from the same parent, or the result of imperfect impregnation of the individual in whom they exist. The fact, that they are found in the bodies of virgins, even of males, and in other regions of the body besides the ovaries, is sufficient to refute the latter idea, or at least to demonstrate that it is not invariably well founded; and Dr Seymour concludes, that the first is the most probable opinion, and that these bodies are the result of imperfect conception in the mother of the individuals in whom they are formed.

The third chapter, which is devoted to the subject of treatment, contains, as might be apprehended, little that is new or unknown. For inflammation the usual antiphlogistics are recommended. For scrofulous affections the invigorating effects of pure air, nourishing diet, mild and recruiting climate, and alkaline medicines are prescribed; and the soothing effects of hemlock extract as a local application in the form of injection, are favourably mentioned. Extract of meadow saffron, in grain doses, two or three times daily, is said to have afforded relief in more than one instance; but this may require to be confirmed by subsequent experiment.

In the treatment of what is called ovarian dropsy, Dr Seymour brings himself into unnecessary difficulties by attempting to appreciate the merits of the medicines named diuretics, and, by following the old system of accommodating remedies to the names of diseases, has given his indications both confusion and inaccuracy. We have above shown, that the disease, vulgarly and erroneously named dropsy, originates in inflammation; and the practical conclusion is, that the disease must be checked on this principle in the beginning, or its subjugation cannot be placed under the rules of art, and must be left to the casualties of accident or the resources of nature. We cannot help regarding it, therefore, as totally idle to speak of *digitals*, or even the *pyrola umbellata* in the removal of ovarian cysts. We have repeatedly heard physicians deplore the inefficacy of diuretics, and indeed of all antidropsical remedies in the treatment of ovarian dropsy; but if they had ever reflected on the circumstance, that the malady for which these diuretics were prescribed, was actually the consequence of an attack originally inflammatory, if they continued to regret the inutility of these measures, it must have been for want of using those that were most urgently required. The proper remedy for these cases, if the physician is consulted in time, which we are sorry to say

is rarely the case, is blood-letting, general and local, carried to such an extent as the urgency of the symptoms requires and its effects may seem to justify. We must admit that Dr Seymour allows the employment of this remedy ; but it scarcely occupies the place which it ought to hold in his enumerative list, and it seems rather brought in by the way than introduced as an indispensable and appropriate measure. The reader may peruse his observations, nevertheless, with some pleasure.

“ It is obvious that the sweeping objection which would exclude blood-letting in this disease, must have arisen from misunderstanding its pathology ; when accumulation of fluid or growth are proceeding rapidly, when there is a quick pulse, irregular heat of skin, and acute pain in the part, it is obvious that inflammatory action is going on within the cyst, and will probably eventually be extended to the neighbouring peritonæum ; the fluid secreted is mixed with shreds of lymph, or thickened by the diffusion of purulent matter ; under such circumstances the use of the lancet is employed with much benefit. Even when great depression of vital power has apparently existed, the relief obtained has been very great, and similar to what is experienced in inflammation of an acute nature, when seated in other serous membranes. The pulse has risen in force and diminished in frequency under the flow of blood ; the crassamentum has been unusually firm, and the buffy coat very distinct on the coagulated blood. The oppression under which the patient laboured has vanished under the repetition of the treatment ; and although the disease has been by no means cured, the strength of the patient has been saved, and she has perhaps been brought into the situation in which paracentesis may be employed without risk. It is in such cases that mercury is useful, and as in other inflammatory diseases these remedies appear to be nearly similar in their effects, one diminishing, the other altering vascular action. The comfort experienced after such loss of blood, by the administration of opium, is certainly equal to, if not greater, than that which occurs in inflammation affecting vital organs, and seems to realize the feeling and almost poetical expression of the late Dr Currie of Liverpool : ‘ The patient sinks into a sleep, which is ill exchanged for the realities of life.’ ” Pp. 95, 96.

To emetics he is highly favourable on the principle of promoting absorption. Purgatives are recommended merely to keep the bowels in due action ; but their violent operation is censured. Local friction long continued is also mentioned favourably. Of iodine and its use he says nothing ; but we may take this opportunity to state, that we have seen evident benefit result from the internal use of this agent, and from its local employment by friction, after the acute symptoms had been subdued by suitable blood-letting.

Of puncture or tapping the cyst he speaks favourably, but without laying down general rules. Tapping, followed by in-

jection, he regards from its effects in the hands of Mr Key, who tried it three times without favourable result, as improper and not likely to be even safely used as a general remedy.

In considering the mode of treating scirrhus and malignant diseases of the ovary, he enters on a warm eulogy of the effects of mercury in restraining the action of inflamed vessels and preventing the effusion of lymph ; and from these effects he infers, that it is beneficial in cases of simple inflammation of the cysts, but injurious wherever there is malignant structure. This is perfectly correct ; but the observations are totally misplaced, and would have been much more appropriate in the statement of the mode of treatment in the last or dropsical form of the disease. We regret to remark, that in like manner iodine is introduced and condemned, and even the remedial properties of arsenic, copper, colchicum, and liquor potassæ, Dr Seymour discusses on the same mistaken principle. Surely it was quite superfluous to introduce the consideration of the effects of these agents in the treatment of diseases which Dr Seymour himself admits to be of malignant character, and in the treatment of which we trust no physician, either of knowledge or integrity, would ever think of employing such agents as those now enumerated. Had this discussion been introduced in the previous subdivision, where the treatment of the simple ovarian cyst, or encysted dropsy is considered, they would by no means have been unseasonable ; but to speak of their employment to arrest scirrhus disorganization is so extraordinary, that we can scarcely persuade ourselves that we are perusing a work written in the nineteenth century. Surely if there is any use in good pathology, and in the distinctions which its facts establish, it is, that in instances of disorganization, especially malignant, all stimulant remedies are highly pernicious ; and indeed the less that is done in the way of treatment beyond soothing pain, the less injury is likely to result. It is quite superfluous to adduce here the authority of Mr Brodie or any other surgeon, however eminent, to prove that iodine may be given in such cases. The only inference that results is, that the disease was not of a malignant character.

The operation of excision so often proposed, and at length practised, is much more rational ; and though we would always have the point determined positively, whether the ovary is scirrhus or not before removal, we would by no means oppose the measure, if the patient and the operator had agreed on the subject.

The work is illustrated by fourteen good lithographic engravings, which the student will find highly useful in facilitating his study of the diseases of the ovaries.

This book is written with carelessness and inaccuracy, which

show that the author pays little regard to the exact import of certain terms and modes of expression. He speaks of "inducing a conclusion," p. 32, and states, that "no allusion is made to whether this arises from inflammation or suppuration of the vesicles, or is circumscribed abscess in the cellular structure." Dr Seymour, we believe, is a scholar, as all the fellows of the College of Physicians are understood to be; but it would show becoming deference to public opinion not to trust too confidently to the character of the Royal College, and to write English without awkward expressions and flagrant errors.

ART. II.—*Sketches of the Medical Topography of the Mediterranean, comprising an account of Gibraltar, the Ionian Islands, and Malta; to which is prefixed a sketch of a plan for memoirs on Medical Topography.* By JOHN HENNEN, M. D., F. R. S. E. *Inspector of Military Hospitals, &c.* Edited by his son, J. HENNEN, M. D. &c. London, Underwoods. 1830. Pp. xlii. and 666. 8vo.

IT is well known to most of our readers that the author of the posthumous publication now before us, abruptly closed a life of active professional service during the ravages of the late epidemic fever of Gibraltar. His loss will be severely felt by the branch of the public service to which he was attached. For, among the numerous writers in the medical department of the army and navy, who during the late war have contributed to the literature of military surgery, and of medicine generally, no name stood confessedly more conspicuous than that of Dr Hennen; and the present work shows that, notwithstanding his established reputation, and the prospects of advancement which he had in consequence attained to, he never ceased to consider that something more was expected from his talents and opportunities than the mere routine discharge of his duties. The subject of Medical Topography seems to have attracted his attention at an early period. It was scarcely possible, indeed, that the great importance of this branch of medicine to the well-being of the military service could long escape the notice of so acute an observer. Accordingly, he paved the way for the present work by sketching out, in a paper contained in the seventeenth volume of this Journal, a plan for conducting an inquiry into the Medical Topography of a country. About the same period, he received the appointment of superior medical officer in the Mediterranean, and had thus placed within his reach unbounded opportunities of making practical use of his own in-

structions. This he appears to have commenced doing from the moment he entered on the discharge of his office ; and the result is the elaborate treatise now edited by his son.

The places to which his topographical researches have been extended, are Gibraltar, Malta, and five of the Ionian isles, Corfu, Cephalonia, Zante, Ithaca, and Santa Maura ; but by far the most complete and interesting of the treatises of which the sketches consist are those on Gibraltar, Corfu, and Malta. Each of these sketches is drawn up according to the principles explained by him in his paper in this Journal. After one or two remarks on the name and geographical position of each place, he proceeds to discuss its climate, its soil, the various sources of aqueous exhalations, the general structure of the country, its productions of an animal, vegetable, or mineral nature, the number and physical characters of the people, their mortality, their habits, dwellings, food, drink, dress, occupations, amusements, and morals, their police, the state of medicine, their opportunities of medical instruction, their hospitals, their diseases, their popular medicine, and the works which have been previously written on the Medical Topography. He then concludes each of the sketches with a minute and accurate account of the state of health of the British troops at each place ; and under this head no material circumstance is omitted, which could serve to throw any light on the causes of the most prevalent disorders. The sources from which his information has been drawn, are partly the reports returned from time to time, according to the instructions of the army Medical Board, to the Inspector's office, by the various medical officers attached to the army corps throughout the Mediterranean,—and partly his own personal experience during a residence of several years successively at Corfu, Malta, and Gibraltar, where he served between 1820, and his decease in 1828.

We shall now endeavour to convey some idea of the manner in which Dr. Hennen has executed the task imposed on himself. We must remind the reader, however, although indeed this is scarcely necessary,—that no analysis which it is in our power to give can convey an adequate idea of a work on Medical Topography ; as it must always consist of a collection of general facts which it is almost impossible to abridge and at the same time preserve intelligible.

We shall commence, like the author, with Gibraltar, a place which has of late been an object of fearful interest to the medical officers of the British army, and indeed to almost the whole medical profession of Europe.

The peninsula of Gibraltar is two miles and two-thirds in length, ten-elevenths of a mile at its greatest breadth, and 1439 feet above the level of the sea at its point of greatest altitude. It is connected with Spain by a sandy isthmus, nearly a mile in length, varying in breadth from half a mile to a whole mile, and nowhere raised more than ten feet above the level of the sea. This isthmus, which Dr Hennen conceives to be intimately connected with the state of health of the garrison, is usually termed the Neutral Ground, as it lies between the outworks of the fortress and the Spanish lines.

The *Climate* is on the whole considered healthy. The greatest temperatures observed in ten years subsequent to 1815 were 79°, 86°, 82°, 84°, 87°, 89°, 82°, 83°, 85°, 83°, and the lowest were 52°, 53°, 48°, 54°, 51°, 57°, 45°, 43°, 45°, 59°. When exposed to the sun's rays in the hottest days of September the thermometer has risen to 128°. Between eight in the morning and two of the afternoon the air is extremely sultry during summer; but at other hours it is agreeable. The night temperature is from two to four degrees lower than the day temperature.—The wind blows very nearly the same number of days from westerly and from easterly points, the former being most prevalent in December, January, and May, the latter in July, August, and September. The prevalence of easterly winds is always closely connected with an unhealthy state of the population: Remittent fevers are frequent, wounds put on an unfavourable appearance, and diseases and infirmities of every kind are aggravated. These winds are comparatively moist, especially those from the south of east, which also usually bring with them the heaviest falls of rain.—Rainy days are most frequent in April, then in November and January, next in December and February, next in March, May, and October, and the driest months are June, July, and August. On an average of ten years the annual rainy days were 68; those in April 10, those in March, May, and October, 6 each, those in June, July, and August together only three. Fogs almost always accompany the east winds. In the dry seasons the dust is extremely annoying.

As to the nature of the *Soil*, the rock is chiefly a compact primitive limestone; the soil on which the town is built is a red sand; but here and there in the intervals between the rocks it is a fertile mould, which in the rainy season becomes slimy. The sandy soil of the neutral ground has in many places been converted into garden ground by a superstratum of artificial soil from the foundations of the houses mixed with manure and offal; and here, as well as in numerous gardens within the fortifications, vegetation is extremely luxuriant.

The *Sources of Aqueous Exhalations* would appear on a superficial view to be extremely scanty; but the author considers that all previous writers on the medical topography of Gibraltar have been misled by appearances when they arrived at this conclusion; and that Gibraltar, though certainly far less exposed to miasmata than most other places in the Mediterranean, nevertheless contains within itself ample sources for engendering those exhalations which are conceived to be the cause of intermittent and remittent fevers. It is impossible in this brief sketch to follow him through his elaborate exposition of the various sources of febrile miasma which he conceives he detected. At first sight Gibraltar appears an arid rock on which the rain cannot rest a moment or water accumulate. But on a careful examination, many spots are found where the rain accumulates over a considerable extent of surface, and leaves as it evaporates the slimy mud and rank vegetation, which are believed to be a potent source of febrile miasma in hot countries. In other places the winter torrents, in rushing down the gullies between the rocks, form in their course, or at the bottom, considerable spaces of flat ground, where the soil is a rich clay mould mixed with decaying animal and vegetable matter; and which, though dry during the hot season, have been well ascertained by the fatal experience of our Spanish campaigners to be abundantly productive of noxious exhalations. When we add to the sources now mentioned, the more obvious effects of the putrefaction of the water in the ditches of the fortifications, defects in the construction of the sewers, which, however, have been lately very much improved, and the want of tides to carry off quickly from the shore the offal thrown upon it, or the contents of the sewers discharged into the sea within a short distance from the shore, we shall not be at any loss, our author conceives, to account for the production of remittent or intermittent fever.

A very full account is given by Dr Hennen of the *Vegetable and animal Productions* of Gibraltar. Vegetation is in many places luxuriant; the common kitchen vegetables are either raised within the fort or brought from the adjoining country in profusion; fruits of all kinds, even many tropical fruits, are raised abundantly; and so much garden ground has been brought into cultivation, that in the event of a siege it appears extremely probable that an ample supply of the necessary vegetables would be raised within the fort. The rocks abound with great varieties of wild plants. The principal animals are the goat and rabbit, the former of which is currently kept for supplying milk. Poultry of every kind is raised in great quantity, both within the fort and on the neutral ground; and the sea supplies in great abundance an extraordinary variety of excellent fish.

The *Population* of the town has increased rapidly since the present century began. In 1791 the civil population was only 2885; in 1801 it was 5339; from this it gradually increased to 12,423 in 1813, after which it was thinned considerably by various causes, but especially by the noted epidemic fever of that year; in 1826 it had increased to 15,480. The military population at that time was 5090, of which 3744 were adult males. The civil population is obviously too dense for the extent of accommodation; and accordingly a large proportion of the poorer orders are confined in very small, dirty, ill-aired rooms and cellars. As an example of this Dr Hennen mentions that he found three women and a dog occupied a "sleeping apartment, of the capacity of 200 cubic feet," which is equivalent to a space measuring not quite six feet in each direction. In these houses the ventilation is almost always very imperfect; indeed the rooms are generally shut up altogether during the day, as their tenants work chiefly in the open air. The poorer orders sleep on mats on the floor, dress indifferently, but on the whole live pretty well, their diet consisting of fish, pork, maccaroni, bread, rice, oil, and legumes. Their occupations are principally mercantile; but a large number practise the trade of cigar-making.

The *Police* of Gibraltar was formerly in a wretched state. But the last governor, Sir George Don, amidst many other important improvements, conferred an essential benefit on the town by organizing a vigorous system of police, under which the cleanliness and comfort of the inhabitants has been greatly ameliorated.

Gibraltar possesses an excellent *Civil Hospital*, where in the space of ten years subsequent to 1815, 2333 in-patients and 13,182 out-patients were treated.

The next article, which treats of its *Endemic and Epidemic Diseases*, is a very elaborate one, and would doubtless have received many valuable additions had the author survived the late epidemic. The first recorded epidemic occurred in 1350, when the town was besieged by the Spaniards; but no information has been handed down of its nature. In 1649 great ravages were committed by a disease, which was probably the plague. In 1727, when it was besieged, while in the hands of the British, fluxes were prevalent; and immediately after the raising of the siege, a great mortality spread among the troops, but it does not exactly appear what was the cause. Of a garrison of 5481 persons, no fewer than 500 died in three months. During the siege of 1780 scurvy was prevalent in the garrison; and was evidently produced by the soldiers being obliged to live chiefly on salt meat. In 1782 the epidemic influenza, which ravaged all Europe, was also experienced in Gibraltar.

In 1800, when Dr Hennen first visited it, fevers were prevalent, but of what kind he was unable to learn. They were very deadly, however, for the deaths of the garrison were that year four times the usual average. From this period the station was very healthy till 1804, when the first ascertained epidemic of yellow fever occurred. The annual average mortality for seven years previous in the garrison was only 38 out of 4500 individuals; but in 1804, according to the account published by Dr Pym, 1082 of the military population, and 4864 of the civil population died of yellow fever in the course of less than three months. After this dreadful epidemic the garrison was very healthy till 1810, when bilious remittent fevers were exceedingly common, and a disease, so closely resembling yellow fever as to be considered such by many medical persons, made its appearance in one or two spots, but was fortunately prevented from spreading by the prompt and energetic measures taken to insulate the districts where it prevailed. In 1813 the same disease made its appearance; and, as in the previous instance, it was preceded by bad remittent fevers, by which its true nature was disguised till it had made such progress as to be prevalent in every quarter of the town. The exact commencement of this epidemic was not ascertained, but in July it was very prevalent. In December it was extinct, and during the interval it proved fatal to 441 military, and 883 civilians. In 1814 it re-appeared in the month of August, and ceased in October, during which period 400 of the population died of it; and it is allowed that this epidemic occurred solely among those who escaped the epidemic of the previous year. We have, for brevity's sake, denominated the disease yellow fever; but we need not observe that the opinions of medical men as to its nature have been greatly divided, and we know not whether the late calamitous renewal of it in 1828 has tended to dissipate these doubts. Dr Hennen has very ably collated in the present work the principal arguments advanced by the contagionists and non-contagionists in favour of their respective doctrines. His own opinion is contained in the following passages.

“ I believe that, without any reference to the question of importation, (which I neither assert nor deny,) Gibraltar at all times possesses within itself many local causes of fevers, which, though not generally contagious, are capable of assuming the most malignant type. That these causes were in full and uncontrolled operation upon a densely crowded and filthy population at the periods of epidemic fever, is perfectly obvious from the preceding narrative. I at the same time believe, that the existence of these internal sources of disease was by no means incompatible with the simultaneous importation of a contagious disease from without.

"I am satisfied that the prevailing disease was in various instances propagated by contagion, though by no means universally so; for there are well-authenticated instances of the hospital attendants and medical officers being affected by contact with the sick."—"The contagious qualities of the Gibraltar fever, it is quite clear, were very much under controul; they were evidently diminished, and in many instances totally destroyed by removal to a pure and fresh air, although in other cases these effects were not so obvious."—Pp. 115.

The editor has added in a note, that he was unable to learn from the papers left by the author, what modification his opinions respecting the contagious nature of the malignant fever of Gibraltar underwent after his personal experience of it in 1828; but that it was obvious he had satisfied himself of that epidemic having been of local origin, and not an imported disease. This, indeed, may be inferred from certain statements made by the author in the present work; for he observes, he has no hesitation in affirming, that cases of a disease exactly similar in every symptom and circumstance to the yellow fever, occur both in the civil hospital of Gibraltar and in private habitations every season, and that such cases cannot be traced to importation. They occur at the same time with autumnal remittent fever,—a disease by no means uncommon, notwithstanding the apparent exemption which, to an unpractised eye, Gibraltar seems to enjoy from the sources of that disorder.

The only other diseases besides fevers which are common in Gibraltar, are pulmonary affections and Barbadoes leg. Genuine phthisis is common, and often runs its course with great rapidity. *Bucnemia* or Barbadoes leg is so frequent, especially among the lowest order of Jews, that it is not regarded as a disease, unless it is so extensive as to impede motion. It is not, as in the West Indies, preceded by fever. Its cause is enveloped in obscurity.

Hepatitis and splenitis are rare in Gibraltar, notwithstanding the intensity of the heat in summer. Cholera and dysentery are far from common, except among new comers, and in them, generally arise from errors in diet. It is remarkable that convalescence from all severe diseases is almost invariably slow, so that Dr Hennen recommends the removal of convalescent invalids to the adjacent town of St Roque.

On the subject of the *Deaths, Births, Marriages, Epizooties, Longevity, and Popular Medicine* of Gibraltar, the author has not been able to communicate any information of material value, as he had no accurate sources of intelligence within his reach. A list of all works connected with the topography of the place is given, with a character of each. Under the article *Barracks*,

the author criticizes those of Gibraltar as not in general fitted up with the attention to roominess and ventilation which are required in so hot a climate. In one of them, known by the name of Windmill Barracks, pectoral affections are unusually common, partly, he thinks, on account of the houses lying too directly in the currents of wind, and partly by reason of their altitude, and the fatiguing ascent which the soldiers must climb in order to reach their habitations after the duty of the day is finished.

A few remarks on the diet and mode of life of the troops, and also on the military hospitals, close the topographical account of Gibraltar. It is, on the whole, an extremely interesting memoir. But we have no doubt that the medico-statistical inquirer will regret with us that the author had not access to documents which might have furnished the numerical data necessary for illustrating and establishing his statements. We must infer that no such documents are in existence; a fact that appears not a little surprising, when we consider the peculiar circumstances in which the garrison of Gibraltar has long stood.

The next subject of Dr Hennen's topographical inquiries is the island of Corfu. This Essay is even more interesting and valuable than the topographical sketch of Gibraltar, because less is known of that island, and the information now for the first time supplied is very complete.

Corfu is thirty-five geographical miles in length, and twelve miles at its greatest breadth. It is separated from the mainland of Greece by a channel which varies from two to ten miles in breadth, and from forty to fifty fathoms in depth. It has two ranges of mountains, one of which runs north and south, and the other transversely; the greatest altitude of the former being about 2000, and of the latter nearly 3000 feet. There are several streams of considerable size, most of which, and especially one near the city of Corfu, are sluggish. Many fresh-water lakes or marshy ponds are to be seen over the island, and several near the harbour, which, however, might be easily drained. Several salt-water lakes surrounded by extensive marshes also exist; and one of these, about four miles in circumference, is five miles from the citadel. Another lake, that of Bucintro, situated on the opposite continent of Greece, is believed to have a powerful effect on the health of the inhabitants of Corfu nearest it. It is above three leagues in circumference, is surrounded to a great distance by a marshy deserted country, is the daily resort of countless multitudes of aquatic birds, and is considered the most pestiferous marsh in all Greece. In addition to these natural sources of miasmata, the

French, at the time the island was taken possession of by the British, were busy constructing an artificial one in the shape of a great ditch or canal nearly two miles long, proceeding from one of the suburbs of the city towards a salt water lake. The French lost 2000 men in cutting it; and it was subsequently found so pregnant a source of disease, that one-half of what had been cut was filled up in 1819 by order of the British government.

The *Climate* is variable. On an average of four years, the thermometer ranged from 44 to 91; and the rainy days were 97 annually. The winds are extremely unsteady. In spring and summer the prevailing winds come from between the north and north-east points, and are cold: in autumn and winter the prevailing winds are from east, south-east, and south, and the more near they are to the last point, the more have they the character of a sirocco. When the sirocco blows it has all its usual effects on the human constitution.

The *Soil* is generally rich, vegetation luxuriant, vegetables and fruits abundant, but inferior in quality to those of the British isles, fish in profusion, and the usual domestic animals numerous.

The *Inhabitants* are of middle stature, well proportioned, and in frame active, though not powerful. Many attain an advanced age; and deformity is almost unknown among them. Their agriculture is at a low ebb. Their only material article of manufacture is olive-oil. Their houses are commodious. In the city of Corfu the sitting-rooms of the better ranks average 24 feet by 12, and the bed-chambers not much less; and even the rooms occupied by the lower orders are about 18 feet by 9. The drains and necessities are very defective and ill-constructed. The city is 2800 yards in circumference, the citadel 1800 yards; and the population within this space is 18,000. The whole population of the island is about 70,000. The people are very dirty in their persons; and for stationary filth, Dr Hennen thinks, no part of the world could produce a parallel to the beds of Corfu. The general food of the lower orders is maize, seasoned with leeks, garlic, oil, and vinegar, to which a little salt-fish or shell-fish is sometimes added: and the ordinary drink is a very weak wine. Their amusements are smoking, dancing, and talking news. Their morals are the worst possible. "The clergy are taken from the very scum of the population, and are, with few exceptions, illiterate, superstitious, and immoral. Their nobles are without honour, their merchants without integrity, and their peasantry ignorant and degraded to the most abject degree." P. 184. The police and police regulations of the city are on the whole good; but

much improvement might be effected in the drains and necessities; and a pernicious practice still prevails among the Greek population of burying the dead in the churches. The poor or indigent population form a very small proportion of it, as there is work for all who will undertake it, and living for the lower orders is cheap. In the city there is an extensive pawning office, or *Monte de Pietà*, which is of great use to the poor.

From this account of their manners and mode of life, it is apparent that among the *Diseases* to which the Corfiots are liable, contagious disorders ought not to hold a conspicuous rank, and that with more attention to cleanliness in their houses and persons, contagion of every sort might be rendered very limited in its operation. The diseases of the natives are in spring synochus, in summer bilious remittents, in autumn intermittents and sometimes typhus, in winter pneumonia, rheumatism, and inflammation of the mucous membranes. Intermittent fever sometimes prevails to a very great extent; and when this is the case, the prevailing disease among the troops is remittent fever. Yellow fever is believed to have prevailed epidemically at the commencement of the present century; and plague, which has on different occasions been imported into the island, was prevalent in 1815. This epidemic, which was clearly traced to importation, has been described by Dr Granville; but our author speaks of his work in somewhat disparaging terms. Diseases of the liver are common; gout was once common, but is now almost unknown; tubercular phthisis is rare.

The *Medicine* of Corfu is very antiquated; and indeed the natives trust much to nature. There is in the city an hospital for the sick poor, which is managed entirely by the natives, and that indifferently enough. A foundling hospital also exists, which is under the management of the British. It contains about 90 children. In five years subsequent to 1817, 115 were received, of which thirty died; and for fifty years prior to 1820, the admissions were 1439, and deaths 1088; but this information is incomplete, as it does not supply the age at which the institution ceases to record deaths on its books. There is also a female venereal hospital; by means of which, and the enforcement of certain police regulations, syphilitic disorders are kept under, much to the advantage of the health of the garrison. The quarantine establishment was not long ago very corrupt and inefficient, but since the island came under British government it has been under excellent management. Vaccination has been long resisted from religious prejudices, but is now gaining ground.

After this account of the circumstances which affect the health of the natives of Corfu, Dr Hennen proceeds to discuss

more particularly those which affect the healthiness of the troops. This department of his inquiry is conducted with great regularity, and is almost complete. The only material deficiency is a collection of proper numerical data for comparing their health and diseases with those of the native Corfiots.

He commences the investigation with an account of the barracks, hospitals, and mode of living of the troops. His observations on the first of these topics, though concise, are extremely important and interesting, as calling the attention of military surgeons and commanders to various essential points, which ought to be attended to in the construction of barracks in hot countries. These it is impossible to abridge. We may shortly advert, however, to one remarkable circumstance. A little island, about four miles in circumference, lies near the harbour of Corfu, which used to be reputed so healthy, that invalids were sent thither from Corfu to recruit. When the British troops took possession of it, they were very unhealthy, although in addition to its high reputation, the island possessed apparently all the characters of salubrity. For this various reasons were assigned, and among the rest the vicinity of the extensive marshes around the lake of Bucintro—twelve miles distant! Dr Hennen, however, shows from various pointed facts that marsh miasmata never travel nearly so far; and after stating that the little island itself contains no sources of deleterious exhalations, he arrives at the conclusion, that the unhealthiness of the troops was owing to the great alternations of heat and cold to which the men were exposed in wooden barracks, together with the total want of shelter on the island, either from the great heats of summer, or the winds. These barracks have been latterly abandoned.

The *Diseases* prevalent among the troops are deduced from a series of accurate records, including seven years subsequent to 1814. The average strength of the garrison in these years was successively,

| | 1815 | 1816 | 1817 | 1818 | 1819 | 1820 | 1821 |
|-----------------------------------|------------------|------------------|------------------|------------------|-------------|-------------|------------------|
| | <u>2867</u> | <u>2989</u> | <u>1821</u> | <u>1670</u> | <u>1898</u> | <u>1684</u> | <u>1785</u> |
| And the average sick daily, | 116 | 112 | 105 | 86 | 92 | 99 | 126 |
| That is per 1000 of the garrison, | 40 $\frac{1}{2}$ | 37 $\frac{1}{2}$ | 57 $\frac{1}{2}$ | 51 $\frac{1}{2}$ | 48 | 59 | 70 $\frac{1}{2}$ |

The total admissions into hospital during these seven years were 15,191. The total deaths were 1361, or about *one in*

forty-five of the whole admissions. The average ratio of deaths in successive years, for every thousand admissions, was

| | 1815 | 1816 | 1817 | 1818 | 1819 | 1820 | 1821 |
|---------------------------------------|------|------|------|------|------|------|------|
| | 33 | 35.3 | 30 | 20.5 | 22.5 | 13.1 | 14.3 |
| Or for every 1000 of the garrison, | 12.8 | 33.3 | 33.3 | 26.3 | 29 | 16.6 | 20 |

Of the 15,191 admissions, no fewer than 5721 were cases of fever, comprehending 3299 common continued fever; 1400 remittents; 1020 intermittents; and 2 typhus. The deaths from fevers were 170, of which 40, or one in 82½, were from common fever; 119, or somewhat more than one in 12 from remittent fever; 10, or one in 100 from intermittent fever, and one from typhus. In the successive years there occurred:—

| | | | | | | | |
|---------------------|-----|-----|-----|-----|-----|-----|-----|
| Of continued fever, | 111 | 303 | 293 | 546 | 838 | 590 | 618 |
| — remittent — | 114 | 719 | 202 | 136 | 59 | 40 | 130 |
| — intermittent — | — | — | 124 | 102 | 97 | 100 | 213 |

These numbers, however, will furnish much more interesting data, if we attend to the proportion they bear to the average strength of the garrison each year. For 1000 men the numbers stand thus each year.

| | | | | | | | |
|------------------|------|-------|-----|-------|-------|-------|-------|
| Continued fever, | 38.6 | 101.3 | 161 | 326.8 | 441.5 | 350.5 | 346 |
| Remittent — | 39.7 | 240.5 | 111 | 78.4 | 31.1 | 23.5 | 73 |
| Intermittent — | — | — | 68 | 61.1 | 51.1 | 59.5 | 119.3 |

The mortality from these diseases differed extremely in different years. Thus, in 1000 admissions, the deaths were:—

| | | | | | | | |
|--------------------|------|-----|-----|------|-----|-----|------|
| Continued fever, — | 13.2 | 6.8 | 7.5 | 22.7 | 8.5 | 9.7 | |
| Remittent — | 154 | 42 | 158 | 125 | 188 | 100 | 61.5 |

Hence it appears that when continued fever is very rare, remittents are also very rare; that when the former is somewhat more than usually prevalent, remittents are extremely frequent; and that when continued fever is extremely prevalent, remittents are not more than usually frequent. It also appears that when continued fever is either uncommon or very prevalent, its mortality is greatest, and that when it prevails in its usual degree its mortality is least. On the contrary, the mortality of remittent fever seems, with few exceptions, to decrease materially as its frequency increases. How far these differences may arise from the lists of the two species of fever being inaccurately taken, in consequence of cases being drawn from the one denomination when the other prevails, we cannot venture to decide. But the reader will perceive, that in this way most of the dif-

ferences stated will be in some measure accounted for ; and Dr Hennen admits, with every other author, that it is often extremely difficult to distinguish them.

Next to fevers the most important disease has been *Dysentery*. Of the 15,191 admissions, 805 cases of acute, and 80 of chronic dysentery were received in seven years ; and the mortality was one in $32\frac{1}{2}$ of the former, and one in $14\frac{1}{2}$ of the latter. *Pneumonia* occurred in 337 cases ; among which the mortality was only one in $84\frac{1}{2}$.

Some very curious facts are stated with respect to the prevalence of thoracic diseases. These are so numerous that we cannot pretend to transfer them to our pages ; we must be content with merely stating the general results. The proportion of pulmonary complaints to the number of cases of all diseases varies considerably in the different Ionian Islands, from one in 13.7 to one in 30.7 ; and this proportion appears to bear almost exactly an inverse proportion to the frequency of remittent and intermittent fevers. That is, where malaria is most prevalent, pectoral disorders are least frequent.—Another interesting circumstance unfolded by Dr Hennen is the much greater frequency of pectoral complaints in the navy than in the army. According to the researches of Dr Sinclair, which were conducted on a very large scale, the pectoral cases in the navy stationed at Gibraltar, Minorca, and Malta, bore the proportion of one to two and a half of all serious complaints. But in the army at Corfu, their proportion during the seven years above-mentioned was only one in nineteen ; in the whole of the Ionian isles one in $20\frac{1}{4}$; and in the whole Mediterranean islands one in seventeen. This is a very striking difference, and much of it is undoubtedly real. But the author on this, as on many other occasions, does not take the proper standard of comparison in stating the prevalence of the disease. It is not so much the proportion of any disease to the total amount of diseases, as its proportion to the population, which it is important to know, particularly when the object is to compare its frequency in one place or in one class of men with its frequency in another. The author's mode of estimating the comparative prevalence of pulmonary disorders in the different Ionian islands, as well as in the army and navy, is vitiated by probable differences in the general unhealthiness. The proportion of any disease ought always to be stated in reference to the average strength of the garrison or crew.

Cholera has been rare among the troops at Corfu. In seven years there were only 81 cases of this disease ; and the deaths were four. *Hepatitis*, too, was not very common. There were 65 cases of acute, and 59 of chronic hepatitis ; and of these

eight cases of the chronic variety died, but none of the acute. *Small-pox* was never observed, *Measles* in six cases only, and *Scarlet-fever* in two. When the *Plague* visited the island in 1816, only 28 of the garrison were seized with it, and of these only three recovered. *Syphilitic diseases* are very little known, and only in their mild form. *Ophthalmia* is much more rare than at other Mediterranean stations. In seven years there were among 15,191 admissions only 581 ophthalmic cases, or one in twenty-six. We shall presently find how strikingly this proportion differs from that observed at Malta. *Apoplexy* and *Palsy* are singularly unfrequent. During seven years there occurred only one instance of the former, and ten of the latter disease; and of the whole eleven only three died. Forty-two cases of *Epilepsy* occurred, of which four proved fatal. There were eight cases of *Insanity*. Dropsy, in the form of *Anasarca* was observed in sixteen cases, of which two only ended fatally; and in the form of *Ascites* there were six cases, all fatal. *Scurvy* occurred in one soldier in 1820, and in seven the subsequent year. There were only two cases of *Aneurysm*, one of *Stone in the bladder*, one of *Cancer*, four of *Hernia*, and one of *Diseased heart*. *Rheumatism* occurred in 135 cases, of which one was fatal. The accidents were 1421 bruises, of which eight were fatal; 159 incised wounds, two fatal; 31 fractures, two fatal; 844 punishments, one fatal; and 10 dislocations, 18 burns, 27 sprains, and 13 gun-shot wounds, none of which were fatal. The punishments appear to us excessively frequent; on an average they amount to 120 annually in a corps of 2102 men, or one in $17\frac{1}{2}$.

Several valuable appendixes have been added by Dr Hennen to his account of Corfu. They are an elaborate account of the prevalence, character, and prognostics of the different winds; an account of the effects of the Sirocco; a list of the Flora of Corfu, with the economical uses of such plants as the natives apply to any useful purposes; an extract from the History of Gregory of Tours, proving that he was familiar in the sixth century with the doctrine of contagion; and a minute numerical table of all the diseases and casualties among the troops at Corfu for the seven years between 1815 and 1821 inclusive.

We shall pass over Dr Hennen's observations on the Medical Topography of the other Ionian isles, although a great deal of interesting information is contained in his narrative, in order that we may give a full analysis of the most valuable of his sketches, that of Malta.

This celebrated and important island lies almost in the middle of the mouth of the great bay in the African coast, bounded

by Cape Bona and Cape Razat, and is 200 miles distant from the former and 56 miles from the nearest point of Sicily. It is about 20 miles long and ten at its greatest breadth.—The island of Malta is low, no part of it exceeding 1200 feet in height; but the surface is beautifully diversified; and would be picturesque were it not for the almost total want of trees. It contains neither rivers, lakes, nor morasses; but it is a mistake on this account to suppose that it does not present any *Sources of febrile miasma*; for in many places there are “fiumares” or beds of winter torrents, which by retaining underground moisture long after the surface is dry, are now well known to engender marsh fevers in hot countries; and besides near the shore, even in the vicinity of the city of Valetta, there are several spots of considerable extent, which were formerly morassy, and though now drained, still possess enough of their original character to account for the remittents and intermittents occasionally remarked in their neighbourhood. These spots have been very carefully pointed out by the author; but we must refer the reader to his work for the particulars.—The *Soil* is of a very peculiar nature. It is almost every where exceedingly thin, and in many places the rock is completely bare. But this rock, which consists chiefly of carbonate of lime with about seven per cent of alumina, is in general remarkably soft and crumbly, so that with very little expence of labour, it may be easily broken down and converted into a soil of extreme productiveness. In this way many fields are every year reclaimed, and it is probable that much of the land at present under cultivation has been reclaimed in a similar manner. To this peculiarity of the soil the natives attribute, and apparently with justice, the dryness and general healthiness of their island.

Various statements have been given forth to the public by different authors as to the *Climate* of Malta; and several of these are far from being correct. All agree, however, in its being healthy. In 1820 the maximum of the thermometer out of doors in the shade was 90°, the minimum 46°. Within doors it sometimes rises to 93° and even 97°; and in the sun it has been observed at 130°. The barometer varies but little. The hygrometer ranges through a wide extent, from 28 to 110. In summer the sun is clear and most oppressive, and remains so long above the horizon that the houses heated by it through the day have not time to cool during the night, so that there is little difference within doors between the day and night temperature; and the latter is of course much more oppressive than the former. In spring and autumn, the dews are very heavy. The south, south-west, and north-east bring fogs, and the east rain, which falls with tropical violence, chiefly however, during the night.

Partly owing to the latter circumstance, partly to the absorbent quality of the soil, the rainy season is not, as in other hot climates, unhealthy. The sirocco winds are severely felt at Malta; and while the sirocco blows, simooms are not unfrequent, though always of very short duration. " Their heat is almost intolerable, literally like that from the mouth of an oven. If long continued, I have no doubt they would extinguish animal life altogether. Fortunately they last for no more than a few seconds, rarely exceeding half a minute in duration, and seemingly confined to a narrow space, like a slip in the atmosphere, if I may so express myself; for they will be felt in four or five houses and not in the adjacent ones, and in one ship in the harbour and not in another. On the 16th of June 1824, for instance, the crew of a frigate in the harbour were so convinced that their vessel was on fire, that they rushed simultaneously on deck." p. 447.

The chief *Vegetable Productions* of the island are cotton, cummin, and oranges. Esculent vegetables, with the exception of the potatoe, are abundant and of good quality. Fruits are for the most part of inferior quality. The corn grown every year on the island is equivalent only to four months consumption. The verdure is very partial; and there are extremely few trees. All the ordinary *Domestic Animals* are to be found on Malta; but the cow does not thrive; at least its milk is indifferent, and goat's-milk is almost universally used in place of it. The markets are profusely supplied with fish. The agriculture in consequence of the lightness and shallowness of the soil is carried on with extremely simple implements. The only important article of manufacture is cotton.

The *Population* of the island in 1824 was 96,404, and is said to have been increased by 40,000 during the late war. In 1823 that of Valetta was 25,546, and three towns on the opposite side of the harbour from the capital contained 18,649. The *Dwelling-houses* are the best in Europe, being built almost entirely of stone. Even the floors are commonly of stone. They are therewithal very cheap,—a commodious house in the town with twelve or fourteen apartments costing only twenty or thirty pounds of rent, and in the country with a garden half that sum.—The city of Valetta is built on a tongue of land 3200 yards long by 1200 broad; and its streets are regular, arranged in parallel and transverse lines, along which the winter winds sweep impetuously. The police is perfect. By the arrangement of the streets and the discipline and regulation of the police, every district, street, or individual house, can be insulated in twenty-four hours, in the event of a contagious disease making its appearance anywhere. The same measure can be also carried into effect throughout every town and

village in the island. For this admirable system Malta is indebted to the vigorous administration of Sir Thomas Maitland. The beds, bedding, and dress of the inhabitants are simple, but well adapted to the climate and the preservation of health. Fuel is very scarce. Their diet is also extremely simple, and consists in a great measure of vegetable food, with a little Sicilian wine. They are a very industrious, sober people. Their chief amusements are singing, smoking, dancing, bell-ringing, horse-racing, sea-bathing; and these amusements never end in scenes of drunkenness. Their morals in other respects are those of Italy. They are of middle stature, erect, active, rarely deformed, but defectively educated. The women suffer little in child-bed. The children are always swaddled. The poor have increased considerably since the peace; and now the annual expence of supporting the poor, including the civil hospital, is L. 20,000. The civil hospital can accommodate 200 males and 150 females. The Lazaretto is believed to be the best in Europe, and the same may be said of the whole quarantine establishment since it was remodelled by Sir T. Maitland.—The mortality among the natives cannot be very accurately ascertained, as Dr Hennen could not procure proper records for a longer period than five years subsequent to 1818. For these years the number of deaths was 2396, 2663, 2266, 2666, 2929, so that the annual average is 2584, or one in 37.7, taking the population at 96,404. The births during the same years were 3687, 3761, 3468, 3219, 3388, or on an average 3504, so that the population appears to be slowly increasing.

The *Prevalent Diseases* are fever, ophthalmia, dysentery, pulmonary complaints, worms, convulsions, and hernia.—*Fever* is for the most part of the continued type; nevertheless many intermittents and remittents occur every year, of which some are imported from Sicily, while others are undoubtedly caught on the island. The proportion of deaths from fever in the civil hospital on an average of three years prior to 1824 was one in $6\frac{1}{2}$ of the admissions; and in males it was one in $7\frac{8}{10}$, in women one in $5\frac{2}{3}$, in native soldiers one in $23\frac{1}{2}$. Of the deaths which took place out of the hospital, amounting in six years after 1817 to 13,444, 1446 were owing to fever, or nearly one in nine of the total mortality. The proportion varies extremely in different districts of the island. During these six years the deaths from fever in some village districts were one in 34, 35, and 45 of the population; while in Valetta and the adjacent towns it was one in 69 and 83; and in some other village districts one in 100, 101, or 105.—*Ophthalmia* is very common; but the natives seldom have recourse to the hospital unless the complaint is severe. Hence, although the admissions for this

disease are only one in 27, we cannot form any idea of its frequency from that fact; as is apparent from the number of persons with slight ophthalmia who may be seen every day in the streets. The causes of its prevalence are believed to be the excessive dustiness of the air during dry weather, owing to the peculiar nature of the soil, and the great heat and glare of the sun during the day, united with the dampness and dews to which the body is exposed during night in the autumn, when many of the lower orders sleep in the open air.—*Dysentery* is very common, as it appears to account for no less than a seventh of the total deaths.—*Pulmonary Affections* are still more common. In the six years formerly mentioned the deaths out of the hospital under this head amounted to 2376, that is somewhat more than a fifth of the total mortality. The proportion of pulmonary cases which prove fatal is also large. In the civil hospital for three years before 1824 it was about one in $3\frac{1}{2}$ in females, one in $4\frac{1}{2}$ for males, and one in four for both sexes combined.—One-third of the deaths from pulmonary complaints arise from phthisis.—*Tania* and other worms are so common as hardly to be considered diseases.—*Convulsions* carry off a great number of children.—*Hernia* is so frequent as to affect probably a third of the population.—*Liver* complaints are common, but not so fatal as other diseases.—Of Epidemic Diseases *Scarlatina* and *Measles* are common.—*Small-pox* is extirpated. For some years no case of that disease has been seen, and no instance of death from small-pox appears on any of the bills of mortality which Dr Hennen had an opportunity of examining. For this exemption the island is indebted to the universal practice of vaccination, which is enforced by law. *Plague* appears rarely, but its ravages have at times been extensive. Those on record occurred in the years 1519, 1593, 1623, 1663, 1675, and 1813. Of these the plague of 1675 was the worst, for it swept away no fewer than 11,300 of the inhabitants.

On the important subject of the Plague of 1813 a great deal of new and valuable matter has been supplied by our author, who enjoyed singular opportunities for acquiring accurate and complete information. Among these we may mention the public and private papers of Sir T. Maitland, who was governor at the time, and the manuscripts and reports of Count Rivarola, Inspector-General of Police. Of the summary which Dr Hennen has drawn up from the facts thus obtained we can only afford room for a meagre sketch; but we doubt not that every one interested in this momentous subject will have recourse to the original.

The origin of this plague, as is well known, is wrapped in obscurity. It first appeared on the 16th March in the house of a shoemaker, who was supposed to have smuggled some linen from

on board a vessel newly arrived with foul bills from Alexandria; but the proof to this effect Count Rivarola considers defective. Its nature was long misunderstood; indeed, it was not decidedly ascertained till the 16th May, when "it had diverged in so many directions as to bid defiance to all attempts at tracing the line of communication." In July it was at its height. In November it was extinguished. In the interval it carried away 4486 persons, of whom 1223 died in Valetta. The temperature ranged between wide extremes while it prevailed; and in particular it was remarked, that, contrary to what has been observed elsewhere, the summer solstice had no effect in checking it. In July, when it was at its worst, the thermometer varied from 71° to 88°.

Our author was unable to ascertain, after the most careful inquiry, a single authentic instance of the disease having attacked the same person twice; but a striking fact which he learned from a native practitioner was, that many of the attendants on the sick and expurgators, who of course had previously passed through the disease, repeatedly had pestilential eruptions on the hands and arms, as well as painful swelling of the glands in the arm-pits, if they handled infected clothes without the customary precautions. This is the strongest proof possible of the protection which one attack gives against a return of the disease, being analogous to what is observed of small-pox in reference to vaccination, and to the effects we have occasionally witnessed from the operation of the contagion of fever on seasoned constitutions.

As to the question of its dependence on contagion, we need hardly say that a physician with the mind of Dr Hennen would not hesitate to adopt the affirmative side. Among the additional proofs in support of this opinion, we find the following facts. 1. The town of Senglea or Isola lies on the opposite side of the harbour from Valetta, and at the distance of only 360 yards. Being chiefly inhabited by sea-faring people, old Levant-traders, and others familiarized with the plague, the alarm was taken at an early period, and the town was through the influence of these people, and by the instructions of Count Rivarola "sealed hermetically" during the whole epidemic. Not a single case of plague appeared in it, while it raged in every direction around. Dr Hennen examines all the objections and quibbles which might be started against this fact with great ability, and answers them in the most direct and triumphant manner. 2. In one of the regimental hospitals at Valetta, the ground floor, as is often the case at Malta, was occupied by the poorer inhabitants of the city. Here seven families resided, of which four were swept away entirely, as well as three-fourths of the remaining three. But the soldiers and

others in the floor above escaped entirely, as they were kept in a state of rigorous seclusion. 3. The convent of St Augustine, immediately adjoining a district where the plague raged with more vehemence than any where else, was placed by the superior from the very commencement of the epidemic under strict rules as to external communication. For a long time no case of plague occurred. At length a servant of the convent, who purchased some old clothes in an infected street adjoining, was attacked. This man was placed under the most rigid quarantine, along with one of the monks who volunteered to attend him. Both the servant and the monk soon died; but no other person in the convent was infected. 4. From the moment the police regulations were put in force in Valetta, enjoining seclusion and forbidding intercommunication, the number of cases daily reported rapidly decreased. After the experiment was successfully tried there, a detachment of troops was sent to three neighbouring villages where the disease was raging with unabated fury; and the only instructions to the military were to prevent communication with and among the inhabitants, and to enjoin daily ventilation of their persons and their whole property in the open air. At each place the cases of plague diminished rapidly in number from the moment of the arrival of the troops, and in a month the epidemic had ceased in two of them. At last, the only quarter of the island where it was known to exist was in the remaining one of these villages. As soon as this was ascertained by Sir T. Maitland, freedom of intercourse was permitted throughout all the rest of the island, and the plague was proclaimed extinct. It continued some time longer in this village; but no case appeared afterwards in any other quarter. 5. In March 1814, Sir T. Maitland was officially informed that a case of plague had appeared in the island of Gozo, which is tributary to Malta; and the disease was satisfactorily traced to some goods having been smuggled from the village last alluded to. Consequently, a detachment of military accustomed to the duty was immediately sent to surround and prevent all intercourse with the infected district. The result cannot be related better than in the words of Sir Thomas himself, who communicated the account of the proceedings to Dr Hennen. "The plague," says he, "had by this time shown itself in five or six houses in the neighbourhood of that in which it originally broke out, and in this circumference it was immediately confined. Unluckily, however, the commanding officer, contrary to his orders, I believe from necessity, employed a few days afterwards, instead of the regular troops, a guard of the island militia, consisting of seven men, one of whom, being a relation, had communication with the infected houses, caught the plague himself, and gave it to the

rest of the party, and these again gave it to their families. We had now then to begin anew, and to adopt measures against these families. They were immediately seized, put into the lazaretto, and the farther progress was immediately stopped ; *and here the plague of Goxo ended.*" P. 520.

These are powerful facts, perhaps more powerful than any hitherto published, because, besides being matter of public notoriety, they were determined under a most rigorous system of military police, by which every minute occurrence was faithfully reported to the general superintendent and governor.

Various plans were adopted for protection against the plague. But, according to our author, the only precaution which was of any use was anointing the body. Dr Faulkner, indeed, says in his work on plague, that in the epidemic of Malta oily ununction was of no use. But Dr Hennen was informed both by Count Rivarola and by Mr Green, the principal medical officer on the spot, that they dissented entirely from Dr Faulkner's statement. Rivarola denies that the Sicilians mentioned by that physician as having been often infected practised daily ununction as was pretended ; on the contrary, he ascertained that they frequently omitted it on account of the heat and copious perspirations which it caused. Mr Green says " he did not know of a single case where an English soldier who had anointed himself with oil had contracted the disease while employed about the sick and dead ;" and that " he had daily examples of families escaping by means of the oil frictions, although sleeping in quarters occupied by persons who had perished of the disease." P. 523.

Several instances occurred during the plague of Malta of complete immunity from the disease, notwithstanding the most constant and immediate exposure to its contagion.

It was a singular circumstance, that for some years before the plague made its appearance in 1813, the general state of health throughout the island was very bad,—but that, while it prevailed, other acute diseases were extremely rare, and that not only where it raged, but also in districts where it was little or not at all known.

" For four or five years," says Dr Hennen, " preceding that in which the plague raged, sudden deaths were much more frequent than ordinary, and during the twelve months immediately preceding, and especially for the last month of the period, the increase was still more observable, insomuch as greatly to excite public observation and alarm. Canine madness during these years prevailed with a frequency and violence never before observed, and many individuals perished in a state of hydrophobia. Apoplexies and palsies were increased in a remarkable degree, and intestinal worms, *tæniæ*, *ascarides*, and *lumbrici*, were never so general or so nume-

rous in the memory of man. In this state of public health, the contagion of plague was introduced and spread among the people. In the towns and villages where the disease was not introduced, and in those where, although introduced, it was soon extirpated, of whatever size they were, *either no deaths occurred from other diseases, or they were confined to infants in teething, to debilitated persons, or to those labouring under chronic complaints.* Nevertheless, some cases of petechial fever and of natural small-pox were observed. The latter was in a manner confined exclusively to one *casal*, and here it remained during the plague season, and it continued to rage violently in the village till the spring of 1815. No other diseases were particularly observed concomitant with the plague among the natives. I believe that in the military hospitals the usual diseases were treated, but of this I cannot speak positively, for want of official documents."—P. 527.

We have assigned so much space to Dr Hennen's remarks on plague, that we must pass unnoticed many of his remaining observations on this interesting island, such as his account of its epizooties, popular medicine, physic and surgery, medical schools, topographical treatises, native medical authors, libraries, military barracks, and military, naval, and convalescent hospitals,—in order that we may be able to notice the prevalent *Diseases among the troops*, and so furnish the reader with a statement susceptible of comparison with what has been already said on this subject under the head of Corfu.

Dr Hennen procured accurate records of the health of the troops at Malta for eight years prior to 1824, during which the average strength of the garrison was in

| 1816 | 1817 | 1818 | 1819 | 1820 | 1821 | 1822 | 1823 |
|------|------|------|------|------|------|------|------|
| 4007 | 2912 | 2480 | 1648 | 1558 | 1787 | 2480 | 2234 |

The total admissions into hospital were 19,360; the total deaths 312, or only *one in sixty-two and two-thirds*. This establishes a marked advantage in favour of Malta over Corfu as to the mortality in disease generally. In each of these successive years the deaths in every 1000 admissions were

| | | | | | | | | |
|-----------------------------------|------|------|------|------|------|------|------|------|
| | 11.5 | 22.1 | 19.3 | 20.4 | 21.1 | 10.5 | 14.5 | 11.5 |
| or in every 1000 of the garrison, | 9.7 | 18.9 | 22.6 | 22.4 | 23.1 | 14.1 | 16.0 | 11.2 |

The last line of numbers, when compared with the corresponding numbers in p. 151, line 5, establishes this superiority in healthiness still more satisfactorily.

Of the 19,360 cases of illness, 3420 were fevers of all sorts; that is, fevers formed a sixth of the whole cases of disease, or less than a half of the proportion in Corfu. Of this number of

fevers 3003 were common continued fever, 339 intermittents, 74 remittents, and 4 typhus. So that continued fever is as common at Malta as at Corfu, but intermittents only about one-fourth, and remittents about one-twenty-fourth part as frequent. The deaths from fevers were 77, of which 52 or one in $57\frac{1}{2}$ were from continued fever; 13 or one in 6 from remittent fever; and 12, or one in $28\frac{1}{4}$ from intermittents. In each year of the eight already mentioned, there were admitted of

| | 1816 | 1817 | 1818 | 1819 | 1820 | 1821 | 1822 | 1823 |
|------------------|------|------|------|------|------|------|------|------|
| Intermit. fever, | 22 | 153 | 47 | 56 | 11 | 7 | 31 | 12 |
| Remit. fever, | 12 | 58 | — | 2 | 1 | — | — | — |
| Cont. fever, | 541 | 343 | 349 | 286 | 233 | 338 | 603 | 314 |

Consequently, in every 1000 of the garrison, there occurred in these years, of

| | | | | | | | | |
|----------------|-----|------|-----|-----|-----|-----|------|-----|
| Intermittents, | 5.5 | 52.5 | 19 | 34 | 7 | 8.9 | 17.3 | 5.4 |
| Remittents, | 3 | 20 | — | — | — | — | — | — |
| Cont. fever, | 185 | 118 | 140 | 174 | 150 | 189 | 243 | 140 |

The mortality for every thousand admissions of each disease was from

| | | | | | | | | |
|----------------|-----|------|-----|----|------|---|----|----|
| Intermittents, | — | 52 | 8.5 | — | — | — | — | — |
| Remittents, | — | 206 | — | — | — | — | — | — |
| Cont. fever, | 9.2 | 11.5 | 40 | 17 | 21.5 | 6 | 23 | 10 |

The prevalence of fever in Malta is mainly connected with the setting in of the summer heat. Hence from a list of admissions into the military hospital for eight years, arranged according to months, it appears that in July, August, and September, they are three times as numerous as in December, March, and April. The prevailing fever, therefore, is obviously excited by the intense heat of the summer solstice. According to the concurring testimony of several military surgeons referred to by Dr Hennen, it approaches as nearly as possible to the characters of Cullen's Synocha, and is always treated, when violent, by blood-letting.

Pulmonary complaints are common among the soldiers at Malta. In eight years the number of cases admitted into the military hospital was 1637, or one in twelve of the whole admissions. The proportion too is rather on the increase; for in 1822-3, a ninth part of the admissions were for diseases of the chest. These facts supply a further confirmation of what was formerly mentioned (p. 152) as to the prevalence of pulmonary diseases in the Mediterranean, wherever marsh fevers are least frequent. In Corfu, in a garrison whose average number for seven years subsequent to 1814 was 2357, the annual average of pul-

monary diseases was 110,—that is, 46 in every 1000 men. In Malta, in a garrison which in eight years subsequent to 1815, averaged 2388 men, the pulmonary diseases were annually 204 on an average, or 85 in every 1000 men. This is a more pointed mode of expressing the fact than the method adopted by our author of comparing the admissions from pulmonary diseases to the total admissions from disease generally.

Ophthalmia, we have already said, is a prevailing disease among the native inhabitants. It is equally prevalent among the British troops. Of the 19,360 admissions for all diseases during the eight years subsequent to 1815, 1461 were cases of ophthalmia, which therefore formed one in $13\frac{1}{2}$ of the total diseases, and one in 13 of the garrison annually. This is a striking increase over the ophthalmic cases at Corfu, where they formed only one in 26 of the admissions for all diseases, and one in 25 of the garrison. Dr Hennen assigns various causes for its superior frequency at Malta. But the only cause which seems in greater operation there than at Corfu is the extraordinary dustiness of the atmosphere. Whatever may be the source of the tendency to ophthalmia at Malta, there can be no question of its prevalence there; for, independently of the numerical fact already mentioned, any one may satisfy himself of the tendency of the atmosphere to induce an irritable state of the eye after a single week's residence.

Of affections of the bowels the only prevalent variety at Malta is the common mucous *Diarrhœa* of hot countries, which appears to arise from checked perspiration and copious libations of fluids more or less impregnated with bad wine. These cases amounted on an annual average to one in eighteen of the garrison. The disease, as it appears in Malta, is far from being alarming; for of 1086 cases, only 10 died, or one in 109. *Acute and Chronic Dysentery* are by no means so frequent as in climates of the same warmth and greater dampness. The annual average of cases was only one in 34 of the garrison; and the mortality one in 21 of the cases. In Corfu it occurred in one out of $16\frac{1}{2}$ of the garrison. *Cholera* is still more rare. It occurred only in the proportion of one to 180 of the garrison; and the mortality was only one in 53 of the cases.

Apoplexy and Palsy are nearly as rare as at Corfu. The list contains only 19 cases in eight years, in an average of 2388 men. *Dropsy* in the form of anasarca, ascites, or hydrothorax, occurred in 32 cases. *Rheumatism* is more frequent than at Corfu. At the latter island it attacked annually on an average only one in 109 of the garrison; but at Malta one in 32. *Hepatitis and Jaundice* together attacked on an annual average one in 44 of the garrison of Malta, and at Corfu only one in 88.

These observations on the diseases of the British troops con-

clude the author's account of the medical topography of Malta. In an appendix are added several very interesting documents,—an extract on the climate of the island from Dolomieu's *Voyage aux Isles de Lipari*,—an extract on its physical geography from the "Ancient and Modern Malta" of Boisgelin, a Knight of the Order of St John,—a list of the fossils of Malta and Gozo, by Dolomieu,—a Police Report on the population of the various districts of the island in 1824,—a very full account of the admirable Plague Police and Quarantine Regulations of Malta, as improved and established by Sir Thomas Maitland, with the aid of Count Rivarola,—a daily report of the Deaths from Plague in the Epidemic of 1813, taken from the police reports of Rivarola,—and, lastly, a table of the Admissions and Deaths among the troops from every disease in each successive year from 1816 to 1823, inclusive.

From the specimen we have now given of the general facts at which Dr Hennen has arrived in his investigations, the reader will be able to form some idea of the interesting nature of the work to every one who has a taste for the fascinating study of medical topography and statistics. We doubt not that every one who peruses this analysis, and still more the work itself, will join with us in lamenting that in a career of such indefatigable and useful research the author did not survive to perfect his plans, and, more especially, to describe that epidemic, in the management of which he bore so conspicuous a part, and by which he was suddenly cut off in the zenith of his hopes and maturity of his understanding.

ART. III.—*On the Anatomical Characters of some Adventitious Structures.* By Dr HODGKIN. From the 15th volume of the Medico-Chirurgical Transactions, Part II. London, 1829.

IN this paper the author undertakes to explain the peculiarities of those structures which are named adventitious or accidental, and to prove that they are composed of packets of pedunculated bodies enclosed in cysts, and springing as it were from that part to which the peduncle is attached.

After some observations on the importance of distinguishing the spheroidal bladders named hydatids and acephalo-cysts, from the proper serous cyst, which is formed accidentally, and on certain encysted tumours, to which the character of cysts has been rather vaguely and erroneously allowed, Dr Hodgkin proceeds to the proper subject of his remarks by describing the obvious

characters of adventitious or newly formed serous cysts. These, which he remarks resemble the natural serous membranes in forming sacs with shut cavities, he divides into two classes;—the first, the simple, which are mostly solitary, or at least united with one or two more resulting from the operation of the same cause in the same tissue or organ; the second, the compound or gregarious, and the parietes of which are distinguished by the remarkable property of giving birth to cysts similar to themselves, or morbid growths, which, according to the author, are developed according to the same type or principle which regulates the formation of the original or parent cyst.

On the first class of cysts Dr Hodgkin's observations are brief. Examples of them are found in the ordinary serous cysts of the choroid plexus and those of the eyelids, sometimes in the lungs, and the female breast, uterus, and ovaries, in which they constitute one of the forms of ovarian dropsy.

Cysts of the second class, though occurring in any part of the frame, are nevertheless most frequent in the neighbourhood of the uterus, and in the ovaries and the folds of the broad ligament; and these, therefore, the author employs as examples to furnish the general characters of the class. As the disease neither of itself, nor by the parts which it affects, is necessarily fatal, opportunities of tracing by inspection its different stages are rare; and hence pathological observation is confined to its ultimate effects, in which it is almost invariably difficult, if not impossible, to recognize its original and incipient characters. In this state in which Dr Hodgkin describes it, the parietes of the cyst are fleshy or coriaceous rather than membranous, and the inner surface is more or less rough, as if by ulceration or erosion. Its characteristic feature, however, is the circumstance of tumours or elevations dispersed over it more or less abundantly, and which, though varying in appearance, Dr Hodgkin thinks may be justly referred to one general principle of formation.

The most distinct form in which this species of adventitious cyst appears, is that of a general enclosing sac, the inner surface of which presents rounded elevations varying in size, and covered by a membrane, which is continuous with the lining of the general sac. These round elevations are found by dissection to be cysts containing fluid, serous or mucous, that is, with more albuminous or gelatinous matter than serum commonly presents. The inner surface of these cysts, which may be named *secondary*, presents a series of other cysts, each enclosed by membrane, which is also continuous with that of the primary or containing cyst, and which in each case Dr Hodgkin represents to afford as perfect examples of reflected membranes, as the serous mem-

branes in the normal distribution. This last order he denominates *tertiary* cysts.

The proportion of fluid contained in the interior of the whole tumour, or general cyst, varies according to the distribution and relation of the enclosed cysts of the secondary and tertiary orders. Fluid of a serous character is generally associated with secondary cysts of inconsiderable size. When, on the contrary, the general or primary cyst is almost filled by secondary and tertiary cysts, they are observed to be various in size, according as they are more or less freely developed; and since the largest are often so distended as to burst and allow the escape of their contents into the primary cyst, the fluid is generally found to approach more to the mucous character, or to become ropy and viscid, in all probability from the predominance of gelatine. The qualities of this fluid are also further modified by the occurrence of inflammation, to which these cysts are liable. When this process affects the adhesive character, it may produce adhesion of several contiguous cysts, and thus augment much the difficulty of demonstrating their arrangement, and relative distribution. It may, however, assume the puriform character; and its effect is then to give greater opacity and consistence to the contained fluid than without the intervention of this process. In some instances, also, when one or more of the cysts are either brought by inflammation to the ulcerative process, or are killed outright and separated by this process, the contained fluid may be rendered dark coloured, turbid, opaque, and very fetid.

These cysts, though bearing by this arrangement some resemblance to hydatids, are nevertheless quite dissimilar; and may be distinguished from these, according to the author, by two circumstances,—first, by the clusters of secondary cysts being invariably and permanently attached to the internal membrane of the primary cyst, and, secondly, by the transition of delicate vessels from the one to the other.

The secondary cysts may be attached to the inner surface of the primary, by a slender stalk or peduncle, or by a broad basis,—circumstances which Dr Hodgkin regards as opposite extremes in the mode of propagation. The pedunculated cysts may degenerate into tufts or mere filaments, proceeding from the inner surface of the primary cysts, or they may be dilated into a pyriform bag or a grape-like tuberosity. The pedunculated or filamentous processes occasionally grow from the inner surface of the primary cyst at once; but most frequently they are found in the interior of the secondary cysts,—a circumstance which may be conceived to indicate a less energetic degree of vitality employed in their formation. This further seems to be connected with a circumstance of similar character, viz. that the peduncu-

lated cysts often lose their vitality entirely and die, partly as Dr Hodgkin infers from strangulation at the neck or peduncle, but also in some degree from the smaller proportion of vital power under which their developement appears to take place. This event, which is attended with much irritation in the interior of the cyst, may be conjectured to have taken place from the thick grumous and shreddy character of the contents of ovarian cysts.

The sessile cysts, which, like the former, grow in the interior of the primary cyst, are remarkable for producing circumscribed thickening to greater or less extent of its parietes, rather than a prominent tumour; and though developed on the same principle with reflected membranes and tertiary sessile cysts, they encroach more on the general cavity, which is thereby contracted or obliterated, while the section exhibits several cavities of considerable size. From the limited extent also of the points of secondary developement, the secondary and tertiary cysts necessarily assume a radiated arrangement. In ovarian dropsy, depending on the sessile variety of cyst, fluctuation is obscure; and as the fluid is contained in several cavities, the relief afforded by puncture is trifling. The sessile cysts seem never to die through deficient nutrition.

The causes concerned in the production of sessile cysts are undetermined. Though the origin of the disease is often referred to parturition, it is not uncommon in the persons of unmarried or barren females. Dr Hodgkin very properly ascribes some etiological influence to the natural and periodical changes which these organs, in common with other parts of the female reproductive system, undergo.

They occur in the testicle of the male, in the female breast, and in the eye of both sexes; but our limits permit us not to state the details of the author; and we hasten to the application of the facts now adduced, to the explanation of the structure of other orders of adventitious cysts. These are what are denominated heterologous deposits, from the circumstance of consisting of matter, which differs in its anatomical and physical characters from those which take place in the natural state of the animal economy.

The characters above given, though belonging to adventitious serous cysts, in which they are most distinct, may, nevertheless, according to Dr Hodgkin, be traced in other three orders of tumours, scirrhus, in the varieties of tumor known under the names of hematomoid fungus, medullary sarcoma, and cerebriiform cancer, and in melanosis.

On no subject, perhaps, has medical language been more vague and indeterminate than on that of *scirrhus*, cancer, and carcinoma; for every tumour a little hard used to be named

scirrhus, and to every form of bad, unmanageable, or incurable ulceration, the name of cancer was applied. It was an important improvement in Mr Abernethy to show how many forms of tumour might exist without being justly designated *scirrhus*; and most practical surgeons have got over the folly of calling every hard swelling of the female breast, or of the male testicle, by that formidable name. The uterus continues still to be the seat of several multifarious malignant disorders, which ignorance, carelessness, and ill founded decision, continue to confound under the name of scirrhus and cancer. How long this may last we pretend not to say. If these distinctions are often of small practical importance, there are circumstances in which it is of the greatest moment to determine their anatomical characters with precision.

One extreme, however, is almost uniformly the pretext, if not the parent, of another. The extremely vague language used by many of the older authors drove Bayle and Laennec to an excess of refinement, and led them to introduce distinctions which have not yet been verified by observation. We do not deny that several different forms of new structure were confounded under the general names of scirrhus and cancer. But we doubt whether it is possible to enumerate with Bayle, five different varieties of scirrhus, or to distinguish with Laennec the latter from cancer, unless in the stage of progress which it has attained.

This ambiguity Dr Hodgkin laudably attempts to remove, by explaining the anatomical characters of well-marked scirrhous growths. For this purpose, he very properly trusts not to mere section; and he justly remarks, that immersion in alcohol, by indurating the albuminous parts of the tumour, renders indistinct peculiarities of arrangement, which it is important to investigate in the recent state. Dissection in this manner to the surface of the tumour shows that it is invested in a capsule or covering, which has been generally supposed to be condensed cellular membrane, and which, perhaps, is so in the thick external part of the capsule. If inspected in the incipient stage, however, or before disorganization has made much progress, the surface next to the mass of the tumour is smooth and even, and is found to be reflected over one or more pyriform bodies, attached by narrow peduncles to some part of the circumference of the enclosing capsule. In tumours of ordinary size, several of these peduncular bodies are found; and as their interposed fluid is scanty, their form is modified by mutual pressure. They may either be so much detached as to admit of being traced to the base of the peduncles; or they may be united by adhesion so intimately, that, with the delicacy

of their investing membrane, this peduncular arrangement may be entirely overlooked.

The effect of this arrangement is, that the section of such a tumour differs according to the direction in which it is divided. A section through or near the point at which the pyriform tubercles issue from the inclosing cyst, corresponds with the direction which several of these bodies take towards the circumference, and will exhibit their edges in radiated lines. A section carried transversely to the axis of these bodies will represent them in the form of cells of various shapes. The reflected membrane investing these pyriform bodies, if traced further, is found to penetrate at several points into the substance of the tumour, and to form part of the septum which separates one packet of these bodies from the others of which the tumour is composed. The most indurated part indicates in general the common point of origin; and from this the several secondary packets are observed to differ in their respective degrees of progressive advancement.

These pyriform peduncular tubercles, according to Dr Hodgkin's observations, betray in the course of growth the same phenomena remarked in the ovarian cysts; that is, some of the most energetic burst their cysts, and by the rapid rate at which this emancipation enables them to grow, add considerably to the original mass of the tumour. The new matter thus formed is, however, much softer and more tender than the original substance of the tumour,—a circumstance well exemplified in the fungous granulations of several scirrhus growths, and easily verified in those of osteo-sarcomatous tumours, which Dr Hodgkin decidedly refers to this class. The energetic growth now mentioned is confined chiefly to the circumference of tumours, where there is least mutual pressure, and where the nutritious supply from the adjoining healthy parts is most abundant.

In the interior, where mutual pressure is necessarily considerable, the supply of blood is less copious, and the pyriform bodies of which the tumour is composed are necessarily small and undergrown. In some instances this proceeds so far as to produce strangulation and death among several of them, which then operate as foreign bodies, and excite secondary inflammation in the parts still alive. "The result of this compound action," says the author, "is the formation of a cavity filled with broken down softened matter, of a peculiar character, intermediate between suppuration and gangrene."—"When the process proceeds more slowly, the parts which are under its influence gradually acquire an increasing dense structure, and ultimately becoming penetrated by earthy matter, are allowed to remain unproductive of se-

rious irritation, notwithstanding their deteriorated organization, and diminished supply of nourishment. Striking examples of this process are met with in the scirrhous tubercles developed in the uterus, and I have likewise seen it in the liver."

To most observers of any accuracy the cancerous ulcer is well known by its elevated everted edges, its depressed, ragged, yet ungranulating centre, and its ichorous secretion. The mechanism by which these characters are produced is well explained.

"I have shown, that at the external part of the tumour its growth is the most luxuriant, both from the want of pressure, and from the increased supply of nourishment: this will explain why the circumference of the tumour is the most elevated. The central parts, on the other hand, have not only to encounter the pressure which they sustain from the surrounding parts of the tumour, and to suffer the diminished supply of nourishment which this pressure occasions, but, moreover, ulceration having removed the integuments, all supply of nourishment from the surrounding natural structures is necessarily cut off. The depth and irregularity of the central part of the ulcer is often further promoted, by a communication being formed between this part of the ulcer and a cavity commenced and produced in the interior of the tumour by the process which I heretofore described. We may be easily convinced of the general accuracy of the description which I have endeavoured to render intelligible, by making a section through a recent specimen of an ulcerated tumour of the kind I am now describing, in such a manner that the incision may pass through the diameter of the ulcer; by then carefully dissecting the cut edge of the ulcer, we may almost always find satisfactory evidence, that the elevated margin is composed of radiating pedunculated bodies, —whilst in the centre this disposition is less distinct, much more condensed, and exhibits little, if any, trace of organization, excepting in a few spots, in which inflammation appears to have been set up by the irritation caused by the neighbouring dead parts." Pp. 37, 38.

In tumours of the class now under consideration, the fluid is contained either in the intervals between the pyriform tubercles or in their cavities. Serous in general, and often ropy and viscid, it may be bloody, or yellow and opaque,—a quality which it derives most generally from death and consequent destruction of several of the cysts. In tumours with dense structure, approaching to cartilage, it is almost invariably viscid and ropy.

The solid matter varies in consistence from the firmness of stone to the softness of the infant brain, or of weak glue. In the early periods of the disease, they are light-coloured and translucent, and the membranous investments being thin and feeble, the whole mass is soft and compressible. In the same manner the primary cyst may contain, instead of a cluster of pyriform bodies, a few, or even a single one, which is nearly

transparent, and of amber or blood-colour, owing probably to coagulable lymph penetrated by blood-vessels, which, however, are inadequate to maintain the vitality of the structure to which they are distributed. This structure becomes afterwards white and opaque,—a change which Dr Hodgkin ascribes to its vitality being lowered, but which, we think, depends rather on its progressive spontaneous coagulation. If the vessels do not give way, its whiteness persists; but when they are broken, the effused blood pervades and discolours the surrounding substance. The last appearance Dr Hodgkin met chiefly in tumours of rapid growth, dependent on hematoid and medullary fungus.

One of the most characteristic features of the variety of adventitious structure now under consideration, is the tendency which it has to involve contiguous tissues and organs in the action of the new deposit. This principle, which Dr Hodgkin illustrates by one or two examples, is intimately allied, he thinks, with another, that the heterologous are much more readily produced accidentally than the analogous structures. He applies it not only to scirrhus, but to the cerebriiform fungus, and to melanosis, which, when once developed in a part, speedily tinges the surrounding tissues with carbonaceous matter. Nay, he thinks it an illustration of the same principle, though in an opposite direction, that the liability of the eye to this disease may be ascribed to the natural function of the choroid being to secrete the black pigment.

On the characters of malignity, so often and so universally ascribed to these growths, Dr Hodgkin has been unable to arrive at any satisfactory or instructive definition; and for this he substitutes a description of the circumstances which most certainly indicate this disposition. The first of these is the tendency to involve contiguous healthy structures; the second, the characters of the ulcer; the third, affection of the absorbent glands by similar or analogous matter; the fourth, the simultaneous or progressive affection of distant organs; and fifthly, the constitutional taint and its concomitant phenomena. All of these characters are more or less liable to fluctuation and ambiguity, excepting, perhaps, the fourth, which, indeed, cannot be in all cases clearly ascertained, but the influence of which may often be recognized in the effects which follow operations for the removal of malignant tumours. Of this principle, which cannot be too strongly impressed, and of which daily examples come under observation, the following is a valuable illustration:

“ This man came into the hospital affected with fungoid disease of the testicle. The testicle was removed. The disease re-appeared in the cut extremity of the cord; a second operation was performed, which, like the first, was followed by the renewed growth

of the morbid structure. No further operation could be performed. A large bleeding fungoid ulcer occupied the greater part of the groin, and the patient died with all the constitutional symptoms which belong to the last stage of this formidable complaint. On examining the body after death, I found that the new growth which presented the ulcerated surface which I have mentioned, afforded a very complete specimen of the medullary or brain-like matter. I was much surprised in pursuing the examination, not to discover any trace of the disease in the absorbent glands, or in any other part of the body."—Pp. 53, 54.

In this instance, the universality of the malignant diathesis was demonstrated not by simultaneous or progressive morbid structures in distant parts, but by the existence of the malignant disposition in the system at large, in a latent state indeed, but ready to betray presence by its legitimate products.

The sequel of the essay consists of an account of the different species of new or adventitious structures, chiefly with a view to explain their mutual differences and peculiar characters.

In treating of the first of these, namely, scirrhus, there is less novelty than in the part of the paper already considered. On the subject of the tubercular form of this disease, however, as it appears in the scirrhus tubercles of the uterus, Dr Hodgkin communicates some judicious observations, which will be perused with interest.

"They possess a well-defined rounded figure, a close and compact tissue, in which the structure, referrible to the same type as the cysts, to which I have so often alluded, is tolerably distinct, on a much larger scale than that generally observable in true scirrhus tumours in other parts of the body. They rarely, if ever, present any cells or cavities. They acquire a much larger size than true scirrhus tumours in other parts of the system. They never, or at most very seldom, pass into the stage of softening or ulceration, and when formed in the uterus, without any other organ having exhibited a tendency to the production of scirrhus, the formation almost always continues wholly confined to this organ. Consequently, they do not appear to be accompanied by any constitutional taint. On the other hand, their occasional formation, in conjunction with the primary scirrhus and cancerous affection of the mamma and other parts, necessarily connects them with the malignant disease of which I have been speaking. Although these tumours, or tubercles, are little liable to the process of softening, their formation disposes them, in common with other growths of the same family, to a diminution or loss of their vitality. It would seem, however, that this takes place very gradually, and is accompanied by deposition of bony or earthy matter, so that by the time the nutrient vessels are nearly, or quite obliterated, the scirrhus is converted into a bony structure, little susceptible of change, and which may, consequently, be retained to

an almost indefinite period in the system, without material injury to the organ in whose substance it is imbedded. The peculiarities which I have just described as belonging to the scirrhus tubercles of the uterus are, doubtless, in great measure referrible to the part in which they are developed. In the first place, the uterus, as I have before remarked, is naturally disposed to accommodate itself to a stimulus, which excites to an increased supply of nourishment. It is no less remarkably calculated passively to yield to the distension of bodies progressively increasing within it. Moreover, its structure is but little susceptible of morbid actions. Hence the new or adventitious growths have an abundant supply of the nutrient fluid. Their enlargement meets with no violent or partial obstruction, but, at the same time, is subjected to a steady, moderate, and uniform pressure, which tends materially to diminish the relative proportion of the fluid parts, and to which, in the instance before us, we may attribute the absence of cells, and the firm and compact structure of the tumours. Since the fibres of the uterus rarely contract, except during parturition, we need not be surprised to find that the scirrhus tumours developed amongst them are very far from being similarly modified to those which I mentioned as being formed amongst the ordinary muscular fibres, as, for instance, in the deltoid or the masseter. To the little susceptibility which the uterus exhibits with respect to morbid actions, we may, most probably, attribute both its own immunity from the scirrhus affection and the absence of constitutional taint." Pp. 66—68.

The encaphaloid tumour, medullary sarcoma, fungus hæmatodes, or fungoid disease, is the last subject considered in the present paper. The most interesting part is the application of the mode of development above explained, to the structure of this species of new growth.

"The more solid parts of the tumour differ in a marked manner from that which composes the scirrhus tumour. In this disease, the secondary cysts, which are often of large size, generally become filled with a material which at first bears a considerable resemblance to tender or feebly coagulated fibrine or plastic lymph. Into this substance new vessels speedily shoot; but being neither susceptible of perfect organization, nor calculated to remain inert and dormant, it speedily, but gradually, loses its vitality, and, like other transparent parts in which such a change is effected, gradually becomes opaque, and bears, in consistence and appearance, a close resemblance to the substance of the brain of a child: hence the terms, cerebriform cancer, encaphaloid tumour, and medullary sarcoma."—"Although in fungoid disease the solid part of the tumour often bears a striking resemblance to cerebral substance, we frequently find it, on the one hand, deviating into a much more firm material, and, on the other hand, into one of a softer and grumous consistence. Sometimes it has a minutely foliated structure of a pearly white colour. When the diseased structure has com-

pletely lost its vitality, it breaks down into a variously discoloured pultaceous grumous mass, in which the remains of the membranes of the secondary cysts and their vessels may often be detected. Although in a recently formed tumour, or in the newer parts of an older one, the traces of that mode of formation on which I have insisted are sufficiently evident; they are very much lost or obscured as the process of decay advances. It is also at times difficult to distinguish it when the tumour has only advanced to the stage of opacity, provided the substance of the tumour be very uniform, and the membranous parts not only very thin and tender, but adherent amongst themselves and to the contained substance." Pp. 71—73.

Such is the mode in which the present author explains the growth of adventitious tissues; and such very nearly may be said to be the evidence by which he studies to demonstrate the truth of his views. We have endeavoured throughout to exhibit a just and accurate statement of them, and to enable the reader to understand them as distinctly as it is possible to do in the compass of these pages. To offer any opinion on the merits of these views, as to soundness or perfect accuracy, is unnecessary. The subjects of inquiry, though matter of sensible observation, are nevertheless so minute, and are liable, from the different states in which they may be at the moment of inspection, to so many sources of fallacy, that it may be doubted whether, in every point, they can be so distinctly demonstrated as the ingenious author himself believes, and with such certainty as may be requisite to justify implicit adoption of them and their consequences. In demanding this qualification, we do not question the accuracy of the observation of the author, to whom we allow full credit for great patience and diligent research. The views which he unfolds, we may add, have the merit both of novelty and of ingenuity; and they have the further advantage of referring to a single general principle all the different forms of adventitious tissues observed to occur in the animal body. It is almost superfluous to observe, that in the investigation of a subject so difficult, and requiring so much precision and minuteness of observation, it is indispensable to obtain all the evidence possible, and to procure an extensive and varied assemblage of facts. The researches of the present author will, we trust, induce others with similar opportunities to follow the same train of inquiry; and determine to what extent the views of the author are susceptible of demonstration. We shall be happy, in the meantime, to observe that Dr Hodgkin, in the future prosecution of his inquiries, succeeds in confirming his present conclusions; and we shall wait with some impatience to see the application of these views to elucidate the formation of melanotic tumours.

ART. IV.—*Observations on the Functional Disorders of the Kidneys, which give rise to the Formation of Urinary Calculi: with Remarks on their frequency in the county of Norfolk.* By WILLIAM ENGLAND, M. D. &c. Underwoods, London. Pp. 108. 8vo.

THIS treatise consists chiefly of an attempt to ascertain on physiological and pathological principles, what are the leading causes of the formation of urinary calculi, or rather of the tendency to calculous deposits in the urine, in which the formation of calculi directly originates. And the author has no difficulty in arriving at the conclusion, that the leading causes are a diet too purely animal, habitual errors in diet, habitual exposure to sudden impressions of cold from frequent atmospheric vicissitudes, and habitual excessive exertion of the muscles of the loins. The operation of these causes in producing, in a general way, a disordered state of the urinary secretion, is obvious from many circumstances of daily occurrence; and their tendency to bring on calculus of the bladder is pretty directly proved by the copious sediment which appears in the urine, when any of them is brought into action in an excessive degree.

If there is nothing particularly new in this part of Dr England's work, he, at all events, possesses the merit of explaining what is already known in a simple and perspicuous manner; and, on that account, we may recommend his book to general notice. But the only part of his observations to which we propose to call the reader's attention particularly, is the section "on diet and habits of life, as exciting causes of renal disorders;" where he brings forward some information of considerable interest on the differences which exist in the kind of diet and mode of life of the inhabitants of Norfolk, as compared with the rest of the population of the British isles.

We need hardly repeat,—what was already dwelt on at sufficient length in a late number of this Journal,—that Norfolk greatly exceeds every other county of England, as well as Scotland and Ireland, in the frequency of calculous diseases among its inhabitants. In the review of Dr Yelloly's essay in our January number, this fact was clearly brought out from the researches of that able physician. But Dr Yelloly did not enter fully in his paper into the causes of the extraordinary prevalence of calculus there; and, in particular, he seemed disposed to ascribe very little effect to any difference in the food of the peasantry of Norfolk. Dr England endeavours to supply

this deficiency : and it must be allowed that he has been successful in pointing out several circumstances in their manner of living, which, if they are not adequate to account for the great prevalence of a particular class of diseases among them, are at all events in a great measure peculiar to that county, and well deserving of being made known, and kept in view by the medical topographer in his inquiries.

According to Dr England, the diet of the peasantry in the county of Norfolk differs from that of the peasantry throughout England, and still more from that of the Scotch and Irish, in so far as it consists almost entirely of articles made with wheat flour, and contains very little milk, potatoes, or oat-meal. In Ireland, the chief aliment of the peasantry is the potatoe and milk ; in Scotland, it consists of oat-meal, potatoes, and milk, with a very moderate portion of solid animal food ; and throughout most of the English counties it differs but little from that of Scotland, excepting that more solid animal food and more wheaten bread are used. But in Norfolk, the staple article is wheat-flour, which is partly eaten in the form of bread, and partly in that of " dumpling," an article which it seems is proper to this county, and which the author considers a principal cause of the frequency of disorders of the urinary secretion.

" The dumpling," says he, " is formed by adding yeast or ferment to flour, which is made up into a kind of paste or dough ; the panary fermentation is then allowed to take place, and the dough is laid a-rising, as it is called, for a short time : after being formed into round lumps, it is put into a pot of boiling water, in which it is boiled about twenty minutes, if the palate of the consumer wishes for a light dumpling ; if he prefers it heavy, the dumpling is allowed to boil for a few minutes longer.

" The dumpling in this spongy condition is introduced into the stomach, necessarily producing in that viscus an excessive degree of distension, whenever the appetite is sufficiently acute to render the consumption of a large quantity indispensable. But a comparatively small quantity of potatoes, or other vegetables, is combined with this farinaceous diet."—P. 68.

" No alimentary preparation is less capable of digestion than the Norfolk dumpling, when eaten in the quantity in which it is consumed by the hard-working peasant ; it gives great distension to the stomach, and being made of the flour deprived of the bran, or cortical envelope of the grain, it has a natural tendency to induce constipation, when not combined with laxative adjuncts."—P. 70.

The favourite drink of the peasant likewise comes in for a share of the author's disapprobation. This is " public-house beer," which he declares, and we believe with great justice, to be a very different article from the good English home-brewed,

and to possess injurious properties in relation to the animal body, hardly inferior to those of whisky and poteen.

The only other county in England where, according to the author, a diet somewhat similar is used by the peasantry, is in Suffolk; and this is the only county which approaches Norfolk in the frequency of urinary calculus.

Another circumstance as to which he conceives a material difference subsists between the peasantry of Norfolk and those in other parts of the British islands, is the great severity of their labour. He maintains that every stranger, in passing through Norfolk at any season of out-of-doors' work, but more especially during harvest, will be struck with the extraordinary activity of the country people, and the spirit and strength they apply to all their efforts. In particular, they present a striking difference in this respect to the peasantry of Ireland, who, with a rich soil, a genial climate, and few agricultural objects beyond the cultivation of their potato-ground, rarely require to put forth their bodily power with any violence or continuity of exertion. Now, violent exercise, more particularly in the stooping posture, has always the effect of producing a strain of the loins; and Dr England conceives several facts tend to show that such straining has through sympathy the effect of disturbing the functions of the adjacent organs, the kidneys. We are not quite certain of the connexion here attempted to be traced, and suspect that the facts adduced by the author in support of it are susceptible of a different explanation from that which he has put upon them. But the question is certainly worthy of farther investigation.

The last peculiarity which Dr England mentions in the circumstances of the Norfolk peasantry is their climate. In most parts of the kingdom where agricultural occupations form a considerable part of the pursuits of the inhabitants, the country is protected from the blasting influence of the easterly winds either by inland situation, or by a defensive line of interposed mountains. This observation applies particularly to Ireland, and to the greater part of Scotland, except some of the eastern and south-eastern districts. Norfolk, on the other hand, is exposed to the east wind without the slightest protection, so that the blast sweeps over the whole face of the country without any barrier to break its force, or any means to temper its coldness. Hence, Dr England believes, that a comparison with Ireland would show a material advantage on the side of the latter in point of the mean temperature of the seasons. But independently of a difference in thermometric temperature the want of hilly ground or mountains to break the impetuosity of the cold wind is an essential disadvantage on the side of Nor-

folk, the amount of which, as a refrigerating agent, the thermometer cannot enable us to appreciate.

Such are the leading facts brought forward in this treatise, with the view of establishing, in the condition and habits of the Norfolk peasantry, certain peculiarities which may serve to account for their great liability to calculus. We need scarcely say, that before the facts now stated can be held adequate to this explanation, more pointed evidence must be required of the tendency of the circumstances in question to excite a disposition to calculous secretion in the kidney. It may be also well to consider whether the facts themselves are established with sufficient certainty. As for ourselves we are not in possession of the means of judging; and we apprehend a very intimate acquaintance indeed with the habits of the peasantry in different parts of the country will be required before any one can pretend to speak with authority in the matter. The peculiarity of the Norfolk dumpling, on which the author, with much apparent reason, lays great stress, may be easily ascertained. But as for the alleged greater violence of lumbar exertion, and the predominant power of the easterly winds in Norfolk, these are points on which we must confess that more precise information is desirable.

ART. V.—*Pathological Researches on Inflammation of the Veins of the Uterus, with additional observations on Phlegmasia Dolens.* By ROBERT LEE, M. D., Physician-Accoucheur to the British Lying-in Hospital. (From the 15th Volume of the Medico-Chirurgical Transactions.) London, 1829, Pp. 68.

SOME time ago we gave a sketch of the evidence which has been lately adduced by different authors to determine the pathological character of the swelled leg incident to puerperal females; and in the course of examining that doctrine which ascribes the phenomena of the disease to inflammation of the iliac and femoral veins, we took occasion to mention several of the defective points in the chain of evidence, and to express the hope that these might be supplied by subsequent research. We have now to direct the attention of our readers to the further investigation of this topic by Dr Lee, the most recent, and unquestionably the most able and zealous supporter of the doctrine in question.

In the present essay, the author modifies the original form of the doctrine so far as to show that *Phlegmasia dolens* is a concurrent and accidental effect of a much more serious affection,—

inflammation of the uterine veins, to which the puerperal state is liable. By the evidence of several cases with necroscopic inspections, he shows that uterine phlebitis, though most frequent in the puerperal state, may take place independent of it; and that when it extends by continuity through the hypogastric into the anterior iliac and femoral veins, it induces the peculiar tumefaction of the lower extremity named *phlegmasia dolens*.

The first case detailed by Dr Lee, though not tending to the demonstration of the fact now stated, is nevertheless valuable as a good example of the combination of the swelled leg with inflammatory deposits within the right femoral vein, external iliac, right common iliac, left common iliac and its branches, and the inferior *cava* as far up as an inch below the entrance of the *vena cava hepatica*. In some of these vessels, for instance the right femoral, the deep and superficial branches and the saphæna, the contents were chiefly coagulated blood, and may therefore be thought to exhibit the traces only of obstruction to the current through their canals. The distinction, however, between the effects of mere obstruction and those of inflammation was recognized by the degrees of adhesion of the coagulum; for although this coagulum did not adhere to the coats of the superficial and deep branches, or those of the saphæna, it adhered firmly to those of the femoral vein, which were further considerably thickened. In short, this case must be allowed to be an unequivocal example of venous inflammation producing obstruction to the current of blood through the vessels, and the characteristic swelling of the lower extremity; and it possesses the peculiar advantage of establishing three pathological points.

The first is, that while the cases adduced by Dr Davis, and even that given by Dr Lee in his last communication, might without injustice be imputed to mere mechanical obstruction in the pelvic veins, resulting from the pressure of the gravid uterus, and especially the uterine efforts during parturition, the present manifestly must be ascribed to the circumstance of preliminary inflammation.

The second point resulting from the appearances in this case is, that, so far as a judgment can be formed, venous inflammation may proceed in a certain manner, and to a certain extent, without proving fatal. The obliteration of the right femoral vein, and the deposit contained in it, were, according to the usual rules for judging in such circumstances, not of recent origin, and might be referred to an attack of phlegmasia, under which the patient laboured twelve years before that which was fatal. Her recovery from the first attack, and her death by the subsequent one, after so long a lapse of years, enabled the pathologist to determine with greater certainty than in the ma-

jority of cases, the comparative effects of different degrees of venous inflammation.

The third inference resulting from the phenomena of this case is, that the uterine veins and the internal iliac or hypogastric trunks may be inflamed and obstructed without inducing the painful swelling of the lower extremity; but the moment this inflammation extends from the posterior into the external iliac, the characteristic tumefaction begins to appear. The left internal iliac and its branches were more or less filled by morbid deposits; and the internal iliac, at its junction with the common iliac, was completely closed; but neither the external iliac nor the femoral vein exhibited any morbid change.

The histories of the second and third cases enable Dr Lee to advance a step further in his investigation. In these the author not only demonstrates the effects of inflammation in deposits of lymph and obliteration of the area of the canal, but he traces this process into the branches of the uterine veins, and recognizes its commencement in these vessels as they issue from the womb. In the first of these two cases especially, in which the appearances were most distinct, the veins named the uterine plexus on the left side were completely plugged by firm reddish clots of lymph, which extended into the large veins and the left hypogastric trunk, which was entirely closed, and in some points converted into a cord-like substance; and in those proceeding to the right hypogastric vein, as far as its junction with the left common iliac, similar changes had taken place.

The phenomena now enumerated, Dr Lee employs to prove that the case of obliteration of the *vena cava* and its branches, after parturition, recorded by Mr Wilson, must have originated in inflammation of the uterine veins. Two other cases, also mentioned by that author, he adduces to establish a conclusion of very great importance in determining the exact circumstances concerned in the production of *phlegmasia dolens*. In the first case recorded by Dr Lee in the present essay, we have already seen that though there was inflammation of the uterine and hypogastric veins of the left side, and more or less obliteration of their cavities, yet no painful tumefaction of the extremity was observed. In the cases mentioned by Mr Wilson, the same absence of affection of the lower extremity was recognized. It is therefore by no means without reason that Dr Lee infers, though by no means confidently, "that it is essentially requisite to the production of the disease, that the inflammation should extend from the iliac into the principal veins of the extremity. In all the examples," he continues, "which have come under my observation, this extension of the inflammation has been distinctly marked by increased sensibility,

and by a hard and distended state of the femoral vein, from Poupart's ligament to some distance along the inner portion of the thigh."

The views now stated we regard as elucidating, in a very decided manner, the etiology of this obscure and perplexing malady. They show at once why the painful swelling of the lower extremity does not take place in every case of uterine *phlebitis*, and are of the utmost consequence in tracing the connection between this affection and the veins of the pelvis and lower extremity generally. While Dr Lee is justly entitled to the merit of suggesting this mode of explaining the difficulty, and of adducing satisfactory evidence of the justice of his views, he observes the most respectful deference to the authors who preceded him; and though the effect of his researches is to demonstrate the inadequacy of those of his predecessors, his dissent is expressed in the most respectful manner. His subsequent account of the mode in which the disease appears to be generated may be perused in his own words:—

"The facts which have now been stated afford a more satisfactory explanation of these phenomena, and show, that if inflammation be excited in the orifices of the uterine veins, it may spread along these to the iliac and femoral veins, and by the morbid changes induced in them, give rise to all the subsequent symptoms.

"The mode of development and extension of the inflammation from the uterine to the iliac and femoral veins of the affected extremity, will be best understood by a concise statement of the principal facts relating to uterine *phlebitis*, of which *Phlegmasia Dolens* must now be considered as merely one of the remote consequences.

"When the contents of the gravid uterus have been expelled in parturition, the orifices of the uterine veins, where the placenta had been attached, are left open, and a communication is indirectly established between the venous system, and the atmospheric air, in a manner somewhat analogous to what takes place in amputation, and other extensive wounds. Such a condition of the uterine veins, in consequence of the separation of the placenta, must be favourable to the production of inflammation; and inflammation once excited is seldom limited to their orifices, but extends with greater or less rapidity along the continuous membrane of the uterine veins, to the spermatic or hypogastric veins, and from thence to the vena cava, and its principal branches returning the blood from the lower extremities.

"The effects of inflammation in the uterine veins are the formation of adventitious membranes on their inner surface, and the deposition of coagula of lymph or of purulent matter within their cavities.

"Coagula of the fibrine of the blood, which often extend a considerable distance into the uterine veins, are formed in their orifices after every labour, and are the principal means employed by nature

for the permanent suppression of uterine hemorrhage. These may be distinctly perceived for a long period after delivery, and they have a form and colour different from the coagula produced by inflammation. In opening the body of a patient four weeks after confinement, I observed distinct traces of these partially absorbed coagula in the muscular substance of the uterus, at the part where the placenta had adhered.

"The inflammation may be limited to the veins, but not unfrequently the muscular tissue of the uterus contiguous to them participates in the inflammation, and becomes of a dark red or blackish brown colour, and so soft in its consistence as to be readily torn with the fingers. The peritoneal covering may be also affected, and the usual consequences of puerperal peritonitis will then ensue.

"The veins which return the blood from the uterus and its appendages, may be either wholly or in part inflamed; generally, however, and this is a circumstance in the history of uterine phlebitis deserving particular attention, the inflammation attacks the spermatic veins alone, and for the most part the one only on that side of the uterus to which the placenta has been attached; and it may either confine itself to a small portion of the vessel, or extend throughout its whole course, from the uterus to the vena cava. The usual consequences of inflammation of veins are then apparent, viz. injection and condensation of the cellular membrane in which they are imbedded, thickening, induration, and contraction of their coats, and the deposition of lymph, mixed with pus and coagula of blood within their cavities.

"The same is the case with regard to the hypogastric veins, one only being generally affected. These veins are, however, rarely inflamed, in comparison with the spermatic, and this would seem to depend on the latter veins being invariably connected with the placenta, to whatever part of the uterus it may happen to be attached.

"But inflammation having once begun, it is liable, as I have before stated, to spread continuously to the veins of the whole uterine system, to those of the ovaria, of the Fallopian tubes, and broad ligaments. The vena cava itself does not always escape, the inflammation spreading to it from the iliac or from the spermatic veins. This occurrence seldom takes place to a great extent through the medium of the spermatic, the inflammation usually terminating abruptly at the opening of the spermatic into it on the right side, or of the renal on the left. If it pursue, as it sometimes does, the direction of the kidneys, the substance of these organs, as well as their veins, may be involved in the disease.

"Uterine phlebitis appears to result from the mechanical injury inflicted by protracted labour, from the force required for the extraction of the placenta in uterine hemorrhage, from retained portions of placenta undergoing decomposition in the uterus, the application of cold, and probably of contagion, and from various unknown causes operating on the uterine system after delivery.

"It is perhaps impossible to determine, for the most part, the

precise period of its invasion, from the total absence of local pain, and of other symptoms; but it is probable that it most frequently begins soon after delivery, and remains stationary for a time around the orifices of the uterine veins, as phlebitis has been observed to do, where it occurs after venesection. Of this, however, we can have no certain proof, nor can it be admitted to be a general occurrence, from the rapidity with which the inflammation has been found to attack the uterine, spermatic, and renal veins. In one case the disease proved fatal on the evening of the fifth day after labour, and on dissection, all these veins were found disorganized.

"It may be stated, as the general result of all the observations hitherto made on uterine phlebitis, that it occurs most frequently from the 10th to the 20th day after parturition, though it has been observed to commence at an earlier, as well as at a much later period.

"Where the veins alone are inflamed, the peritoneal and muscular tissues remaining unaffected, there is often either no pain or only a dull pain, with a sense of weight in the region of the uterus, and no other local symptom by which the disease can be recognized. The uterus, too, may return to its usual reduced volume, or nearly so, and it is only on the accession of the constitutional symptoms, which have been already detailed, that the existence of this insidious and dangerous affection can be determined. If the substance of the uterus be affected, this organ remains above the brim of the pelvis, large, hard, and painful on pressure, as in puerperal peritonitis.—Pp. 31—36.

The disease now described Dr Lee regards as much more frequent than is generally imagined; and to this he refers several of the fatal maladies described under the general name of puerperal peritonitis. In favour of the justice of this view, it may be observed, that in most fatal cases of peritonitis the veins of the uterus are filled with purulent fluid,—a clear proof of previous inflammation. When the disease is once established also, it has a tendency to induce various morbid processes of disorganizing character in remote organs and tissues. This fact, which was first brought forward by Mr Arnott, as lately noticed in this Journal, is corroborated by the testimony of the present author, who adduces examples of cases in which uterine *phlebitis* was combined with gangrenous inflammation of the lungs, suppurative destruction of the joints, ulceration of the articular cartilages, and maladies equally remarkable for their destructive tendency.

We doubt, nevertheless, whether it can be allowed to add to the truth and certainty of the doctrine advanced by Dr Lee, that inflammation of the uterine veins may be associated with other diseases of a formidable, unmanageable, and generally fatal character. It is quite manifest from the facts adduced by the author, that uterine *phlebitis* is of itself a very dangerous,

severe, and often a fatal disease, and that it has a tendency to induce, as demonstrated by Mr Arnott, disorganizing processes in textures and organs remote from that primarily affected. If the disease be either fatal of itself, or by the effects which it tends to produce, it does not add probability to the hypothesis that it is the cause and primary agent of a disorder so generally mild as *phlegmasia dolens*. We must not, therefore, conceal the fact, that the inconsistency of the fatality of phlebitis and the harmlessness of *phlegmasia dolens* remains still unexplained. In short, the pathological inquirer who adopts this view must endeavour to reconcile the still discordant facts of the severity of *phlebitis*, and the mildness of *phlegmasia dolens*. This Dr Lee attempts to do by showing that occasionally there are attacks of venous inflammation which are distinguished by the adhesive rather than the suppurative and spreading form, and that in these recovery has taken place spontaneously. This was the nature of the inflammation in the first attack of the first case, in the fourth, fifth, and sixth cases,—and in the one communicated by Mr Copland Hutchinson at the close of the essay, which is further remarkable for showing that the disease may occur in the male, and consequently ought not to be regarded as originating in all instances in the uterine veins.

Dr Lee, indeed, does not regard *uterine phlebitis* and *phlegmasia dolens* as diseases peculiar to the puerperal state. He adduces two cases of ulceration of the uterus, one from cancer, the other from phagedæna, to show that these affections gave rise in the one case to inflammation of the uterine veins, and in the other to painful swelling of the lower extremity. In short, from the researches of the present author, it results that inflammation of the uterine veins is a disease of frequent occurrence, and may take place in a large proportion of the maladies incident to the organ to which these vessels belong. We think it is not unreasonable to conjecture that inflammation of the veins of different organs is a disease by no means uncommon, and that further research will show that to this cause are to be referred many anomalous and obscure disorders, and several unexplained and unexpected deaths. The reason of the greater frequency of the occurrence of this disorder in the uterine veins, is obviously the circumstance of parturition and its effects. It is no trivial service rendered by Dr Lee to pathological science, that, though his hypothesis of the origin of *phlegmasia dolens* is not perhaps entirely free from objection, he has directed the views of the physician to an important disease of frequent occurrence and fatal character in the puerperal state.

ART. VI.—*Practical Remarks on Amputations, Fractures, and Strictures of the Urethra.* By STEPHEN LOVE HAMMICK, Surgeon Extraordinary to the King, and late First Surgeon of the Royal Naval Hospital at Plymouth. London, 1830. 8vo. Pp. 266.

THIS work comes rather late. Had it appeared twelve or fifteen years ago, when the subjects of which it treats were still invested with the freshness of novelty, and before the zeal of the present generation of surgical readers had been wearied by discussions on amputations and fracture, and all the accidents of flood and field, it would have stood a much better chance of receiving general attention than at present it does. Unfortunately, the topics treated by Mr Hammick have been already so amply and so recently discussed by Guthrie, Hennen, Copland Hutchinson, Thomson, and Samuel Cooper, besides others of inferior note, that we fear curiosity is now gratified, interest extinguished, and all doubt removed, so far as is practicable, from the points most likely to create diversity of opinion.

Nor has the author been more fortunate in choosing the form of his work, which is in the shape of lectures, as they were delivered at different times to the assistants and pupils of the Royal Naval Hospital at Plymouth. Now, though lectures constitute a very convenient form for communicating oral instruction, they are not in all instances equally appropriate for the purpose of general information. The method of teaching by lecture admits greater diffuseness and perhaps familiarity of style, more minute details, and altogether a more colloquial manner than that by written directions. The lecturer also necessarily introduces, for the sake of completing his instructions, many topics which could find no place in essays written merely with the view of communicating what is peculiar to the author; and whether this be the case or not, a reader invariably regards a course of lectures as containing little which is not already known. Some few exceptions, indeed, to this rule occasionally occur; but the number is too few to justify an author in preferring this to the ordinary method of communication.

Notwithstanding these obvious disadvantages, however, the present work is on several accounts entitled to attention. As the result of a long period of practical observation and experience, by one whose opportunities in the public service have been by no means common, these remarks contain much use-

ful matter, and exhibit a very just view of the most rational and improved modes of treating several important surgical diseases. Another advantage of the work is, that, although the subjects are common, the manner in which they are treated is original. The author does not lay before his pupils a cold, and inanimate detail of precepts compiled from the writings of others, but delivers interesting and spirited sketches of the effects of injuries, of the best mode of performing several important operations, of the difficulties in which the peculiar circumstances of cases frequently place the practical surgeon, of the means which were employed to obviate them, and of the results obtained under different combinations of circumstances. For the numerous and varied emergencies, indeed, of surgical practice, which are not easily brought under the operation of general rules, these lectures are extremely well adapted, and will be perused with much interest by the surgical reader.

Some idea of its contents may be formed by the following short account of the subjects treated. Mr Hammick begins with the trite, though necessary, subject of amputations, and delivers the rules to be observed in amputating the superior and inferior extremities with that care, order, and regularity, which show that they proceed from one who has been long familiar with their practical observance. He then explains the best method of removing limbs at the hip and shoulder-joints, considers the best kind of ligatures and the mode of applying them, the practice of tying veins, the removal of ligatures and the supervision of locked jaw. Mr Hammick then proceeds to the subject of fractures and dislocations, compound fractures, gun-shot wounds, and such accidental consequences as caries, necrosis, non-union, and its mode of treatment. In the third lecture are treated fractures of the patella, simple and compound, fracture of the leg, vesication, erysipelas, gangrene, and denudation of the bones. Then follow fractures of the face, of the clavicle, and of the ribs with emphysema and wounds of the intercostal artery; fracture of the scapula and bones of the arm; injuries of the spine and concussion of the chord; and the section is wound up by a discussion on the question of amputation during the progress of gangrene. The subsequent part of the volume is devoted to the subject of strictures of the urethra, their varieties, causes, and modes of treatment, and such complications as urethral calculus and fistulous openings. These different subjects the author examines with much attention, and communicates on them a large proportion of useful information. As we cannot pretend to give an analysis of the remarks of Mr Hammick, we shall merely select one or two to-

pics for observation, in order to communicate some idea of the nature of the work.

From the following extract some opinion may be formed of the opportunities of Mr Hammick, and of the extent of experience from which his rules are deduced.

“ Having now given you, gentlemen, an outline of the manner in which I have been accustomed for some years to perform amputations in this hospital, it will not, I should hope, be deemed improper for me to state, that during my service I have performed two hundred and eighty-seven amputations, of which sixteen have died ; but that, within the last eighteen years, the number of amputations has very considerably decreased, not only by the termination of the war, but from the malignant ulcer, which unfortunately for some years made such ravages in the navy, having been driven from it : so great at one time was its destructive nature, that within twelve months fifty limbs were removed in this hospital, the greater part in consequence of that disease : happily, however, for some years past no amputation has taken place from it.

“ On the 1st January 1809, a public book was provided, in which each surgeon was ordered to keep a record of all his operations, and a quarterly copy to be sent to the Board. From this official document it appears, that from the 1st January 1809 to the 30th March 1829, when I solicited and obtained my retirement from the public service, forty-nine amputations were performed by me ; viz. twenty-two of the thigh, seven of the fore-arm, ten of the leg, nine of the upper-arm, and one at the shoulder-joint. Of these forty-nine amputations two have died ; viz. the forty-first and the forty-fourth. John Mitchell, received on the 7th September 1825, having been sent home in a packet from Lisbon, with a sloughing popliteal aneurism of immense size, which had burst in the ham before quitting the Tagus ; and on the passage to England the integuments in the ham had also given way, when violent hæmorrhage came on ; and when he was landed at Falmouth, he was in such a state of danger and debility, that Captain King, the commanding officer at that port, immediately sent him by the steam-packet to this hospital, in charge of his own surgeon. More bleeding took place in this second conveyance, and he came to me on the 7th September, too weak to justify any thing being done ; but in two days, having rallied a little, we gave him the only chance, by removing the limb ; but he sunk away, and died four days afterwards. The preparation of the sloughing artery and ham is in my possession.

“ The forty-fourth amputation was John Thorn, of the Breakwater department, whose arm was removed at the shoulder-joint, soon after the receipt of the accident, on the 23d September 1826. The stump went on well, but he died on the 30th, in consequence of extensive mortification of the back, which had been injured by the roof of the iron crane, against which he had been violently carried up, and for some time suspended against it, by his arm having

been caught by the cogs of the wheel, which caused the necessity for its removal at the shoulder-joint.

"In addition to my own amputations, I have actively assisted or been present at those performed by the surgeons of the hospital and the assistants: whilst they were permitted to operate before 1803; and after I became the first surgeon, at all those by the second surgeon in his department: besides which I have attended at most of the operations performed at the military hospitals at this port; and for several years subsequent to the commencement of the war in 1793, at nearly all amputations performed at the prison depots and hospital ships, besides being very extensively invited to private cases; so that I calculate that at the least I have witnessed four hundred other amputations. It is, therefore, from this mass of experience that I have presumed to give you the result of my observations on this important subject." Pp. 39-41.

On the subject of applying ligatures to veins, the author must allow us to say, that he speaks with rather too much confidence.

"Sometimes," says he, "we find the large vein,—as, for instance, the femoral, pouring out a considerable quantity of blood, which, in a very debilitated and emaciated subject, is hazardous to be lost. I never hesitate a moment in passing a small ligature on it, the same as I would on an artery, and I have never found the slightest danger to arise from having done it. There are two circumstances that induce me to put a ligature on a bleeding vein;—one, where the actual loss of blood is of considerable moment to the safety of my patient; the other, the chance of the bleeding continuing after the patient is returned to bed, where the loss of blood is not of itself of consequence, but where it would produce mischief from being thrown out, and lodged within the lips of the stump, preventing the union of the parts by the first intention: therefore, although I do not seek to tie the vein where it can be avoided, yet I am never restrained from doing it from the least apprehension of any ill consequence. I assure you, gentlemen, I have never had the slightest cause, in any one instance, to repent of having so done." P. 51.

Now this, to speak of it in the mildest manner, is by no means judicious advice to impress on the younger members of the profession. No doubt Mr Hammick has not seen any bad consequences follow this proceeding, and perhaps nearly the same testimony might be given by half-a-score of practical surgeons. But the fact is ascertained beyond controversy, that a ligature applied to a vein is very often followed by inflammation of its interior, and the usual fatal consequences; and it is quite impossible to predict whether, in any individual case, the same result may not take place. The proceeding is further unnecessary. Though the vein may effuse blood for a little, it quickly ceases to do so, unless the tourniquet is retained, or the bandages are too tight;

and the proper rule is to remove the tourniquet instantly, to apply cold, and to withhold the use of bandages till the hemorrhage has entirely ceased. These measures will in all cases be found adequate to check the hemorrhage.

In treating of non-union, Mr Hammick is equally hostile to the different modes of treatment by direct irritation, actual cautery, the seton, and excision of the ends of the bones. The last he admits to be most likely to succeed, but to be a severe operation. Severe, however, as it is, it is rendered requisite by the circumstance, that the fractured extremities are in the state of a fistulous sore, or encysted abscess, and generally secrete purulent matter. To change or to arrest this process, the most certain means are no doubt the removal of the secreting surfaces; and it is on this account that the removal by excision, though the most severe and difficult, is the most effectual.

Under the head of the mode of dressing lacerated integuments, Mr Hammick relates an instance of very improper use of strapping and bandaging.

“ A gentleman was driving his gig,—the horse running away, he was jerked from his seat, so that his leg was thrown out on the wheel, which tore his clothes and boot, lacerating his leg, by tearing up the integuments just over the tibia: the surgeon, who was immediately called, replaced them, which could not be done without some degree of exertion; he then put on his straps, and bandaged the whole up: on the third day I was requested to see him, his attendants being alarmed at his fainting and great prostration of strength, which they were at a loss to account for. On asking how the leg was, they said, ‘ That is going on very well; it was for thirty-six hours after the accident exceedingly painful, but is now quite easy;’ and on inquiring whether it had been lately seen, they answered, ‘ Not since the first dressing; but it became so comfortable just before this depression, that we thought it a pity to disturb it:’ they were now, however, immediately taken off, and the leg was found in a state of mortification; so that in spite of all our efforts it rapidly extended up the thigh to the groin and lower part of the abdomen, and he died in forty-eight hours from my first seeing him. I am persuaded that the tight strapping and dragging together of lacerated, nay, of almost clean incised wounds, is often the cause of dreadful erysipelatous inflammation. Never use any violence in bringing into contact torn-up integuments; let them be coaxed gently together, or as near as they can be, and retain them by the simplest means: let your bandages be applied with the view of support, not compression: be not over solicitous to bring the edges in close apposition, because you know that lacerated edges never can unite by the first intention, and yet it is desirable by gentle means to restore them as nearly as you can; for if you can only get them two-thirds back into their situation, it is so much gained, as frequently on the first dressings being removed they will not be found to be so much retracted,

and may be all united excepting the lacerated edges, which must slough; therefore it is of the greatest consequence to get them as close as you can, without running the risk of encountering inflammation, and consequently frequent mortification." Pp. 146-148.

The observations on injuries of the spine are rational and judicious; and he impresses particularly the necessity of attending closely to the symptoms which indicate concussion or inflammation of the spinal chord. On the subject of fracture of the odontoid process and death by suspension, we find the following remarks:

"A fracture of the dental process is a rare accident; but when it happens, it is usually not from a blow at the back part of the neck, but from one in front, striking the head back. The ligament has been known to be destroyed from the venereal disease making ravages in the throat; the head without any fore-warning dropped forward, the spinal marrow was compressed, and the person died. Luckily this is a very rare occurrence, notwithstanding deep ulceration on the anterior and upper part of the pharynx. You know that the common opinion is, that a man who is hung dies from his neck being broken, or put out of joint, and some suppose that the dental process is broken off, or the vertebræ dislocated, from the ligaments being ruptured, or that death is occasioned by a species of apoplexy, so that the vessels of the head are ruptured; but nothing of this is ever the case, as far as I have seen; for I have had an opportunity of examining a number of men who have been hung at various times in this port, and sent to us for burial, as well as others; but I have never detected one who had any ligament or process broken, or indeed any part of the spine fractured; nor indeed did I ever meet with a vessel ruptured in the brain from hanging, though this we should think very likely to take place. The vessels were found injected and congested to the greatest degree, similar to what is seen in violent attacks of the head; and those of the neck were distended both above and below the pressure of the rope; but were it not for the mark around the neck, I do not know whether you could tell that a man had died from hanging." Pp. 183, 184.

To the operation of trephining the spine and cutting down to elevate depressed vertebral fragments, he is decidedly hostile; and expresses himself against it in the most positive manner. The following extract exhibits a view of the arguments by which this operation may be opposed.

"You have heard a great deal lately of the advantages of operating on the spine in cases of fractures of the vertebræ, and some patients have been subjected to the saw; now, supposing that this operation could ever be useful, it could only be so where a portion of the bone was depressed, and encroached on the spinal marrow without breaking down or injuring its structure: now how are we to know the exact condition of the parts? the spinal medulla is a slender and very delicate cord, inclosed in a hard bony case, whence

that depression must be slight which does not irrecoverably destroy its function ; and again, on what portion of the vertebra could you operate, its body being quite out of reach ; the transverse processes you could not well come at : then is the operation only to be performed when the arch is driven in ? and how are you to know when it is, or what may be the real condition of the fracture, or indeed often if there be any at all ? Suppose, however, that you could operate with as much facility as on the skull, to which reference has been made by some of its favourers, you are to recollect that there is a vast difference between the bone covering the brain and that of the spinal marrow, for whilst the skull is merely to protect the brain, the spine not only protects the spinal marrow, but supports the body ; if you take away a large portion of the skull, you only rob the brain of so much of its protection, which loss Nature makes up in some degree in successful cases by a thickening of the dura mater, but if you were to remove a portion of the spine, it is impossible to tell whether the parts will be ever so firm as to be able to sustain the body. But, throwing aside every other objection to this operation, its difficulty, its severity, its tediousness, and the agony it causes, and the injury it does to the surrounding parts, are more than sufficient reasons, I should think, to forbid its being employed. Whoever has been accustomed to remove any diseased vertebræ from the dead subject will not, I should believe, be very anxious to meddle with the fractured vertebræ of the living. We have had many severe cases of fractured spine where the patients recovered, and certainly some apparently very slight ones where the persons died, but there is not a single instance that I know, of any person having lived where the operation has been performed. We have had patients die here from fractures of the vertebræ, where, by the most careful examination, neither the medulla nor its theca appeared to have been at all directly injured, though paralysis was the consequence." Pp. 192, 193.

In the treatment of stricture, he approves most of the bougie, armed with the nitrate of silver, which he appears to have introduced into the Naval Hospital at Plymouth, after some conscientious resistance on the part of Dr Geach, who, however, at length became a convert to the same method. This was so early as 1795 ; and since that time this remedy has been used successfully, apparently in numerous cases of urethral stricture. The cartilaginous stricture he divides by incision after the manner of Mr John Hunter.

In conclusion, though these lectures are not much distinguished by novelty, and though the style in which they are written is careless and desultory, we must repeat that they possess value, as embodying the results of observation made on a very extensive scale, and in a large number of cases ; and are remarkable for the plain common sense by which they are in general distinguished.

ART. VII.—*The Influence of Climate in the Prevention and Cure of Chronic Diseases, more particularly of the Chest and Digestive Organs : Comprising an account of the principal places resorted to by Invalids in England, the South of Europe, &c. ; a comparative estimate of their respective merits in particular diseases ; and general directions for Invalids while travelling and residing abroad. With an Appendix, containing a series of Tables on Climates.* By JAMES CLARK, M. D., Member of the Royal College of Physicians of London, &c. &c. &c. Second Edition, enlarged. London, 1830. 8vo. Pp. 400.

OUR account of this useful and interesting publication was at its first appearance so ample, that we believe it is unnecessary, in speaking of the second edition, to do more than advert briefly to the principal additions which the author has been since enabled to make.

The section on the climate of England has been entirely written anew ; and though it is easy to recognize a good deal of the materials of the first edition, in every place we observe modification and extension, and in some very important additions. Thus, in the account of the Isle of Wight, Dr Clark gives, from personal survey, an interesting description of the physical characters of Undercliff, and explains fully its qualities as a residence for invalids. He points out particularly the circumstances which render the climate of this sheltered spot so mild and favourable for the abode of the delicate and sickly. This situation, which he thinks may be represented as “a lofty natural terrace, backed by a mountainous wall on the north, and open on the south to the full influence of the sun, from its rising to its going down, during that season at least when his influence is most wanted in a northern climate,”—he regards as one of the warmest, most sheltered, and most equable climates in the British Islands, and the most eligible, therefore, for a large class of our delicate invalids. It is unfortunate that the accommodations in this favoured spot are such as to render its advantages available to a very limited number only of residents. In other respects this is no serious objection. In the event of its becoming frequented as a Madeira station, there is still an opportunity of constructing houses in such situations, and on such a plan, as may give it as great advantages in this respect as it has in others over the places usually frequented by the delicate in the south of England.

For the purpose of varying scene and residence, Dr Clark recommends other places in the same island as summer stations. Of these the most desirable appears to be Niton on the western extremity, Sandown and Shanklin on the eastern, and especially Ryde, opposite to Portsmouth, to which, from the open detached manner in which the houses are arranged, Dr Clark is inclined to give a decided preference.

In his survey of the south-western division, Dr Clark introduces some new observations on the comparative advantages of different places, not only as residences, but as affording the means of exercise in the open air. The village of Salcombe, though distinguished for a climate so mild and genial that the American aloe occasionally flowers, and the orange and lemon tree thrive and ripen their fruit in the open air, is, however, deficient in the want of sheltered ground for the latter purpose. In this respect the vicinity of Exmouth and Sidmouth are more eligible.

The soft climate of these places, however, though beneficial to consumptive and pulmonary invalids, Dr Clark regards as likely to exert a relaxing and enervating influence on many constitutions, especially during the summer season; and with the view of obviating these effects, he advises such as are unable to undertake a long journey to repair to some of the drier and more elevated places in the interior. Among the situations adapted to this purpose he recommends, in the first place, Chudleigh, which, being placed five miles from the coast, on a ridge of limestone rock, is justly believed to have its atmosphere deprived of all superfluous moisture. For a still more bracing atmosphere, he recommends Moreton Hampstead in the vicinity of Dartmoor. The climate of this district, however, which is elevated, wild, and picturesque, is not so well suited to the consumptive invalid as it is to the dyspeptic, and those exhausted by the London *asthenia* so well described by Willan. The inhabitants of this city, indeed, would derive the greatest benefit from an annual visit to the wilds of Dartmoor or the Welch mountains, and in these they would find powerful antidotes to the deleterious effects of the fogs and smoke of the winter, and the dust and heat of the summer of London. Of the same character nearly, the whole climate of the north west of Devon on the Bristol Channel is represented by the author, who on this account recommends Ilfracombe and Linton, as excellent summer residences for invalids whose complaints partake of the nervous character.

The account of the physical and medical qualities of Clifton and Bristol, is enlarged and more minute. But our limits prevent us from entering into details.

The part of the volume most completely new, is that on the cli-

mate of the Atlantic Islands, namely, the Bahamas and Bermudas on the western, and the Canaries and Azores on the eastern side of the Atlantic. Though on the medical effects of the physical and meteorological qualities of these islands, little accurate information has yet been obtained, Dr Clark employs what is already known with much judgment and discrimination to explain the effects of their respective climates on different diseases. From these the general fact results, that, to consumptive and pulmonary invalids in general, the climate of the West Indies is decidedly injurious. It was, indeed, long ago shown by Dr John Hunter and by Dr Chisholm, that catarrh, pneumonia, inflammation, and consumption, are frequent diseases in the West India islands, and run their course with a rapidity quite incredible to those who are accustomed to observe these maladies in colder and more temperate regions. As a prophylactic means, however, the West India climate may be useful in retarding the approach of the disease; and it is observed to be beneficial in cases of chronic cough in persons about the middle period of life. To asthma, ague, stomach complaints, and chronic rheumatism, it is represented as injurious. For details, however, we must refer to the work of Dr Clark itself; and we must make a hasty conclusion by recommending it in general terms, not only to our professional readers, but to invalids in general. We cannot, indeed, more properly convey our opinion of the merits and uses of this work, than by saying, that no physician ought to advise change of residence, or to specify the particular situation, without consulting it, and that no invalid ought to go from home without making it his companion.

ART. VIII.—1. *A Treatise on Hysteria*. By GEORGE TATE, Member of the Royal College of Surgeons in London. London, 1830. 8vo. Pp. 134.

2. *Observations on the Disorders of Females connected with Uterine Irritation*. By THOMAS ADDISON, M. D., Assistant Physician and Lecturer on the Theory and Practice of Physic at Guy's Hospital. London, 1830. 8vo. Pp. 96.

NEXT to the merit of discovery and originality of views, ranks that reviving old opinions, and presenting them in new and interesting lights. By means of this invaluable talent, the partial hypothesis is for the time converted into a theory of general application; the exploded doctrine which was thrown aside as an idle gewgaw, is stripped of its antiquarian rust and

obsolete terminology, and, under new and more auspicious names, is once more introduced to the attention of the world.

It is long since hysterical disorders were attributed to the influence of the womb on the system of the female; and, indeed, the very name is a testimony of the supposed origin of these maladies. Hippocrates, Galen, Aretæus, and Celsus,—all the authorities of antiquity, agreed in tracing this complaint to some distemperature or derangement in the functions of this mysterious organ. The same doctrine was maintained, though with numerous extravagant and foolish fancies, by the authors of the middle ages; and BERNARD GORDON, JOHN OF GADDESSEN, BERENGER, and all their contemporaries, pupils and followers, make liberal use of the *matrix* and the menstrual secretion, in explaining the nature of hysterical maladies, which they regarded as suffocation of the former organ, and ascribed either to its excessive repletion, or to preternatural retention of the menstrual flux, or of something which they imagined to be a uterine spermatic fluid.

The first who called in question the justice of these opinions appears to have been CHARLES PISO, who not only acquitted the womb of every share in the mischief, but ascribed the complaint to congestion at the origin of the nerves. Many years after this theory was proposed on the Continent, NATHANIEL HIGHMORE advanced a different one in this country, and, looking at the affection of the organs of respiration in hysterical disorders, imagined he could trace them solely to an impetuous determination of blood to the lungs. This notion was destined to enjoy neither extensive nor long-lived celebrity; and the original Hippocratic doctrine appears to have maintained its ground pretty generally among physicians till the time of WILLIS, who undertook at once to demolish the doctrine of Highmore, and reviving that of Piso, gave it those modifications and extensions which have enabled it to retain an influence more or less general among all the medical schools of Europe for more than a century and a half. The doctrine of this ingenious physician was, that though the hysteric disease depends occasionally on disorder of the womb, or even of other organs, its general cause is in all cases to be found in the brain and nervous system. Had Willis paused at this point, it had been well for his theory as well as its influence. But, by attempting to specify the precise nature of the lesion of the nervous system, he involved himself in the mystical doctrines of the animal spirits, and gave vent to much incredible and fanciful speculation.

The influence of Willis appears never to have been sufficient, nevertheless, to banish entirely the original notion of the

connection between hysterical disorders and the female organs of generation. The circumstance of the occurrence of the paroxysms mostly at the menstrual periods, the prevalence of the disease in the unmarried, the barren, and in widows, its production by peculiar mental emotions, and its occasional occurrence along with phenomena too delicate to be much insisted on, but too distinctly betrayed to be overlooked, were quite sufficient to show that the disease is more or less closely connected with the state of the functions of these organs. This connection, accordingly, has been remarked by all practical authors, and by all the best nosological writers. There is, indeed, nothing absurd in combining the Hippocratic with the Willisian doctrine, and believing that the disease, though dependent on the state of the uterus and its appendages, is also under the influence of the nervous system.

This view, which is doubtless the most natural, and, on the whole, the most consistent with the phenomena, has, accordingly been adopted by WHYTT, the most accurate of practical observers, and by SAUVAGES and CULLEN, our most able nosological authors. The former, after tracing most distinctly the extensive sympathies of the uterus, and their influence on the formation of the hysteric disease, proceeds subsequently to say, that "an obstruction or suppression of the *menses* may produce nervous or hysteric disorders, either from the sympathy of the womb with the other parts, from a redundancy of blood, or from the retention of something hurtful to the nerves."* Both the nosologists, in like manner, distinguished the origin of the hysteric disease from this cause; and the latter allows, "that physicians have at all times judged rightly in considering this disease as an affection of the uterus and other parts of the female genital system." We have little doubt that partly the actual difficulty of the task, and partly the delicacy of the subject, caused him to say, that, on this point he could go no farther, and that he could not pretend to explain "in what manner the uterus, and in particular the *ovaria*, are affected in this disease; how the affection of these is communicated to the alimentary canal; or how the affection of the latter rising upwards affects the brain, so as to occasion the particular convulsions which occur in this disease." It is indeed a matter of difficulty to say how far it may be prudent to admit the doctrine, that a woman of correct moral principle and well regulated thought, may nevertheless become the slave, as it were, of an organ which is well known to be under the influence of the

* Observations on the nature, causes, and cure of Nervous Disorders, chap. iv.

emotions. It constitutes, indeed, a species of materialism to which few persons of correct minds would be willing to allow much weight ; and, accordingly, Dr Hamilton, in his observations on the origin and cause of hysteria, treated it as a visionary and fanciful supposition.

What Whytt, Sauvages, Cullen, and Hamilton, however, hesitated to undertake, the craniological physiologists of Vienna regarded as a very easy task ; and while the elder flattered himself that he had discovered, the younger apostle laboured to demonstrate, the bold and extraordinary doctrine, that the lobes of the cerebellum preside over the organs and functions of generation, and become the primary seat of disorder during the hysterical paroxysm and in hysterical complaints. It must not be denied, that various facts give an air of speciousness and plausibility to this hypothesis ; and if it might be said, that the occipital region of the hysterical lady of Vienna, who inspired Gall with the happy idea of cerebellic influence, was not warmer than any part of the person of that celebrated individual, still it may be replied, that the instances in which injuries of the occipital bone and cerebellum have been followed in the male sex with impotence, show, that the connection is more than imaginary. We believe it is impossible to deny, that in *hysteria* there is an affection of the brain and nervous system ; but the facts hitherto known do not permit the physiologist to fix the exact locality in the cerebellum. It is also equally impossible to question altogether the affection of the sexual organs ; but of the mode of their affection, and of the manner in which they influence the brain, and are influenced by the nervous system reciprocally, as little was ascertained by GALL and SPURZHEIM as by CULLEN.

The principal object of the works before us is manifestly to invest with greater importance, and to impress more forcibly than heretofore, the old doctrine originally maintained by physicians till the time of PISO and WILLIS. Neither of them can be said to possess any thing new, notwithstanding the confident tone in which Mr Tate expresses himself. Dr Addison, indeed, in more modest spirit disclaims all novelty and claims no merit save that of directing the attention of the physician to certain conditions of the generative organs, which he believes to be mainly productive of hysterical complaints.

Mr Tate maintains, that all cases of hysteria, with a few unimportant exceptions, are associated with distinct traces of faulty menstruation. It is either deficient, suspended, or depraved ; too redundant or too frequent in recurrence ; in some instances dark and grumous, in others pale and watery ; and occasionally attended with agonizing pain and sickness. He not unjustly regards catalepsy, the leaping ague, and several cases of cho-

rea, as examples of hysteria; but with less reason he treats with the greatest contempt the idea that hysteria occasionally appears in the male sex.

Mr Tate further distinguishes the disease into three degrees. The first, which is the regular hysterical attack, attended with paroxysms more or less distinct, "is always attended with some irregularity about the menstrual discharge;" "and the stomach, liver, and bowels are in all generally out of order."

The second degree is what has been named the *Protean malady*, a term which the author justly designates as vague and unnecessary,—“a mere mask for ignorance, which ought to be abolished.” Notwithstanding the severity of this denunciation, he evidently feels the difficulty of giving a general description of this form of disease, and after relating several cases to illustrate its most striking characters, he proceeds to enumerate the circumstances by which he thinks it is most certainly distinguished. Of these the first is defective menstruation, which he represents to be the original cause of the disorder, and on which all the other symptoms are more or less dependent. The second is a sensation of pain on the application of pressure or heat, referred to three or four of the six superior dorsal vertebræ, varying from mere tenderness to dull aching pain, and to which, without attempting to say what it indicates, he ascribes the capricious images and fantastic forms assumed by this variety of the disease. The third is circumscribed gnawing pain, confined to a spot not larger than a shilling, referred to the hollow below the left breast, bounded by the cartilages of the fifth and sixth, or sixth and seventh ribs, and which Mr Tate thinks is seated either in the intercostal nerve, or in the twigs of the cardiac plexus. The fourth circumstance in this variety is palpitation, more or less distressing, and occasionally sensations of *globus* and intolerance of light. This form of hysterical disease, Mr Tate contends, has been mistaken for diseased spine, catalepsy, fatal chorea, leaping ague, and various other anomalous disorders. Occasionally, it is complicated with mania.

Hysteria of the third degree is less accurately distinguished by the author. With the last it agrees in originating in derangement of the uterine secretion; in commencing with some violent and alarming symptom, with little or no preliminary illness; in being attended with spinal irritation, probably with affection of the eighth pair, and great sympathetic; and in being protracted for a long, sometimes indefinite period, without trace of improvement. In the course of this lengthened duration, the menstrual function is either suppressed entirely, or is performed at remote intervals with extreme pain; while the individual becomes chlorotic, with great gastro-enteric disorder, and

numerous neuralgic ailments. To this head Mr Tate refers all other cases of hysteria, and sundry anomalous disorders connected with suppression of the *catamenia*, to which it would be no easy task to assign nosological name and place.

Very similar is the theory advanced by Dr Addison. He ascends a step higher, indeed, in tracing the etiological links of the disease; and refers to uterine *irritation* all the disorders of the menstrual function, and all the multifarious effects classed under the comprehensive head of hysterical complaints. This term of *irritation*, Dr Addison does not think it requisite to define otherwise, than by allowing that it is "in common use to signify a disturbance in the endowments or functions of a part, independent of either actual inflammation or organic lesion." Like several modern pathologists, he allows that it may give rise to these effects, but believes that it may exist independent of either.

The symptoms which indicate the presence of this state vary in different organs. In the uterus, according to Dr Addison, they consist of irregular menstruation, the discharge being preceded or accompanied by pain in the back, loins, and thighs, or in the region of the uterus itself, with more or less bearing down; excessive menstruation, either in quantity, duration, or by recurrence; tenderness of the womb on pressure; and, lastly, leucorrhœa. The existence of this state, Dr Addison refers to the predisponent influence of constitutional irritability, especially in persons of delicate frame,—induced or aggravated as it frequently is by sedentary and luxurious habits, late hours, and passions and mental emotions—and to the exciting effect of exertion during the menstrual secretion, frequent child bearing, especially with lactation, sexual intercourse, and every excitement carried to excess.

After an account of the manner in which the different functions, and especially those of the stomach and bowels, become disordered, he directs attention more especially to the following, as examples of morbid sensation dependent on the general influence of uterine irritation on the system at large, and particularly on the abdominal viscera. *1st*, Pain under the left mamma, or under the margin of the ribs of the same side; *2d*, pain under the margin of the ribs of the right side; *3d*, pain in the course of the descending colon; *4th*, pain in the course of the ascending colon, especially towards the right hypochondrium; *5th*, pain affecting the abdomen generally; *6th*, pain in the region of the stomach; and, lastly, pain in the region of the kidneys, sometimes extending along the ureters to the bladder.

The coincidence between the two first mentioned symptoms in this list and the most prominent ones of that of Mr Tate

is obvious, and may be taken as a proof of the accuracy of the observation of both authors. The first kind of painful sensation, that, viz. under the left breast, attributed by Mr Tate to the intercostal nerve or the cardiac plexus, Dr Addison is inclined to refer, though with great and becoming diffidence, to the cardiac orifice of the stomach. The grounds on which he was led to adopt this opinion are by no means imaginary. A young woman in whom it had long prevailed in a very aggravated degree, died suddenly in a fit. After the colon, spleen, heart, and stomach were examined with the minutest attention, the only proof of irritation which Dr Addison could detect, was "a series of very delicate vessels, or rather a blush of redness surrounding the cardiac orifice of the stomach, such as might be supposed to be the result of any continued irritation or spasmodic action." The author justly warns his readers against the error of mistaking it for inflammatory, which it has often been supposed to be.

The second variety of morbid sensation, that, namely, referred to the margin of the ribs in the right side, Dr Addison thinks is seated in some cases in the *colon*, in others in the *duodenum*, from the circumstance of its being occasionally attended with sickness, aggravated by mercurial purgatives, and in some cases accompanied with a sallow dingy hue of the countenance. That affecting the abdomen generally, he regards as neuralgia of that region; and this, with the other circumstances in the history and character of the case, he is anxious to impress on the mind of the observer, with the view of preventing him from confounding these neuralgic with inflammatory disorders which they very closely resemble.

Such is a brief sketch of the hypothesis of the two authors on the nature and origin of hysteric disorders. It cannot be said that in favour of either the proofs are either strong or abundant. Both authors, indeed, explain with sufficient dexterity the phenomena of the disease according to their views; and both doubtless must be allowed to connect the development of the disease with the disorder of the uterine secretions with greater precision than was done by previous authors. This, indeed, constitutes the chief peculiarity in the writings of Mr Tate and Dr Addison, that they demonstrate the connection of hysteria with the uterine disorder in a more precise and satisfactory manner than could be done when anatomy was less cultivated, and the influence of the nervous system and the mechanism of irritation was less understood. In both authors may be traced some approach to the views of Lobstein and of Mr Teale, as noticed in our last number; and one of the great merits of these works, is, that both have the effect of directing the attention of the practical observer more expressly to the

state of the nervous system, both cerebral and spinal, and the influence of this system on the generative organs.

The hypothesis now stated, nevertheless, is not free from objection. Mr Tate, for instance, finds the dorsal vertebrae tender on pressure or the use of the hot sponge, and seems to infer, for we are not permitted to say that he does infer, like Mr Teale, that this indicates irritation of the spinal nerves and their origins. Now, though we did not chuse to object to Mr Teale that he could not recognize the state of the spinal chord through the spinal muscles, the bones, and the membranes, and though the test now alluded to can only indicate the state of the periosteum, and the outer part of the spinal plates, we must now say to both authors, that this method is totally inadequate to ascertain the condition of the spinal chord and its nerves; and whatever success may have attended the remedies employed, the result cannot be admitted as a proof of the accuracy of the diagnosis. In other respects we willingly admit, that it is probable that the spinal chord was in a state of turgescence; but we cannot allow that this probability was established by the means employed.

As to the question of the deranged state of the menstrual function being the invariable cause of hysterical complaints, we would admit it to be established, if we could get over the fact which we know to be well ascertained, that every form and variety of disordered menstruation may take place without giving rise to a single hysterical symptom. We know what is likely to be answered to this, and are prepared to hear it asserted, that, though these did not induce hysterical paroxysms, they produced various anomalous complaints, which were referred to chlorosis, to nervous disorders, and to numerous other evils—all of which ought to have been designated as hysterical. If this be the argument used, we must reply, then is hysteria changed, and has become a conditional term to designate merely the multifarious effects of disordered menstruation. The old argument that hysteria occurs in the male, Mr Tate disregards entirely; and we presume Dr Addison must do so likewise. It is of small moment in the controversy; and, as there may be diversity of opinion about it, we attach to it little weight.

One part of the essay of Mr Tate is entitled to much attention. We allude to the chapter in which he refers the various anomalous nervous disorders to hysteria. It is, indeed, true, that this is by no means new; for the same thing nearly was done by the ingenious author already mentioned, Robert Whytt, who ascribed not only catalepsy and various other irregular convulsive affections, but some forms of mania, to the head of hysteria. No one, indeed, we believe, could doubt that catalepsy is merely a peculiar form of hysteria; for this is rendered as

probable as such an inference can be by the fact, that what are termed cataleptic seizures occur most frequently, if not always, in females, and are in many cases connected with disorder of the menstrual function. Several of the varieties of chorea proceed from the same source.

The mode of treatment adopted by the two authors is accommodated not very accurately to the doctrine which they advocate. The great object with both is to restore the healthy state of the uterus, or, in the language of Mr Tate, to establish a healthy and vigorous menstruation. Next to this, troublesome symptoms are to be palliated; and lastly, tone and vigour are to be restored to the system.

The means by which these ends are to be attained are various. Mr Tate applies to the spine counter-irritation by means of tartar emetic ointment, which he eulogizes much above leeches, cupping, and all forms of local blood-letting, as well as blisters. After this essential measure is put in practice, the alvine secretions are corrected by suitable purgatives; the warm or tepid bath is recommended; chalybeates are employed; and the whole restorative process is properly closed by causing the patient to inhale wholesome air, to eat wholesome food, and to have recourse to wholesome exercise.

The treatment by Dr Addison is somewhat more complex; for it is varied to suit the varieties of disordered menstruation. The measures, of which he most highly approves, as most certain and most speedy in operation, are local applications to the uterus itself, and the adjacent parts. These consist of cold astringent washes, chiefly mineral, injected with sufficient force to reach the upper end of the vagina and the *os uteri* itself, and repeated two, three, or four times daily. The solution which he most generally directs is, the *Liquor Aluminis compositus* of the London Pharmacopœia. To allay irritation, purgatives are recommended, especially castor-oil, when it agrees with the stomach; and in other cases compound extr. of colocynth, with blue-pill or calomel, and hyoscyamus. Blood-letting is condemned, unless in the case of immoderate menstruation, with headach, and other symptoms of vascular plethora. For neuralgia of the belly, oil of turpentine is recommended, in doses of from two drachms to half an ounce, with three or four drachms of castor-oil. The general strength and vigour are to be restored by tonics and astringents, with nutritious but digestible food, and care to avoid the causes of illness.

We regret that our limits do not allow us to enter more into details; and we must refer our readers for more particular information to the works themselves, which are short and easily perused.

PART III.

MEDICAL INTELLIGENCE.

PATHOLOGY AND PRACTICE OF PHYSIC.

Case of Apoplexy of the Spinal Cord. [Nouv. Bibl. Méd., Nov. 1829. From *La Clinique des Hôpitaux.*] A stout man of sanguineo-lymphatic temperament, and much accustomed to violent exertions, was attacked immediately after a profuse sweat with violent shivering, pain along the course of the spine, complete palsy of the bladder and rectum, and loss of sensation in the left, but of motion in the right leg. On the 8th day, when he was first examined at the Hotel-Dieu of Paris, where he was admitted the evening before, the right leg was kept half-bent, and was little œdematous, while the left was permanently extended; the belly was much enlarged by distension of the bladder, which had not been evacuated for four days; on the left side sensibility was much diminished as high up as the nipple. There was no sign of inflammation, the pulse being natural, the tongue moist and whitish, and the skin of natural temperature. The bladder was immediately emptied of two pints of urine. On the tenth day a laxative injection brought away copious involuntary stools. On the eleventh two moxas were applied to the lower dorsal region of the spine, and two others were applied next day. During all this period no change had taken place in the symptoms. On the three following days the patient had no sleep, and on the sixteenth he had difficult breathing, with extreme pain in the loins when he was raised in bed. On the seventeenth the urine was tinged with blood. On the eighteenth there was some improvement in the breathing, and sensibility of the left leg. During the next three days, however, his exhaustion increased; on the twenty-second day he had an attack of shivering; and on the twenty-third inflammatory fever ensued. The urine at the same time became loaded with purulent matter. Enormous eschars gradually formed on the sacrum and trochanters, the paraplegia became more complete, and seemed to rise higher and higher, the respiration was again rendered difficult, and death ensued on the thirty-seventh day.

The brain and its membranes were healthy. The veins of the spinal column were gorged with dark blood. The texture of the bones was dark brownish. Above the level of the superior bulb of the cord, its colour and consistence were healthy. But below this point, on separating the sides of the anterior groove, a bluish appearance was remarked on its surface, which became deeper and deeper in tint towards the level of the last dorsal nerves. On dividing the *tunica propria* to separate the pillars of the cord further apart, a reddish-brown matter was brought into view, which occupied the centre of the chord; and by making transverse sections of the chord, it was easy to see that blood had been effused into its centre, along an inch of its course, at the level of the lower dorsal nerves; that the effusion had commenced on the right side and extended itself afterwards on the left; and that it was confined to the cineritious matter in the centre of the cord. The cord itself under the level of the superior bulb was very soft. The lungs and heart were healthy. The spleen contained several cavities filled with pus, the liver many softish circumscribed nuclei of a green colour, and the kidneys were riddled with purulent cavities.

On the Chemical Solution or Digestion of the Coats of the Stomach after death. [Archives Générales de Médecine, Février 1830.]—An elaborate paper on this in-

204 *On the Chemical Solution of the Coats of the Stomach.*

interesting subject has just been read before the Parisian Academy of Medicine by *Mr Carswell*, a native of this country, and lately a student of the University of Edinburgh, but at present residing in the French capital. We hope to be able, ere long, to present a detailed account of his researches, but will in the meantime give the following abstract of them which has appeared in the *Archives G n rales*. We cannot help thinking *Mr Carswell's* inquiry one of the most interesting that has been lately undertaken in pathology: he has completely succeeded in setting at rest the question which has been for some time agitated as to the nature of spontaneous perforations of the stomach.

He commences with an account of the views of prior writers on the subject. *John Hunter*, in a paper read before the Royal Society of London in 1772, was the first to admit the existence of a chemical solution of the stomach by the chemical action of the gastric juice. In almost every stomach, he maintained that the fundus of the stomach is more or less digested; and he sometimes found the action of the gastric juice extended beyond the parietes of that organ, so as to affect the adjacent organs in contact with it, such as the liver, spleen, and diaphragm. He rested his opinion of the cause of these dissolved spots on several cases of violent, sudden death, where he found the stomach perforated and altered like the food it contained, and likewise on certain similar observations he made on fishes.—*Adams* modified this opinion in so far as he held that the gastric juice never perforated the stomach, unless death was sudden and complete throughout every part of the body.—*Allan Burns* returned to the original opinion of Hunter; but relates three cases where the stomach was perforated on its anterior surface, one where the perforation was at the pylorus, and three where the individuals were weak, emaciated, and died after a tedious illness.—*J ger*, in two essays published in *Hufeland's Journal* for 1811 and 1813, relates one observation and two experiments to prove the possibility of the stomach being perforated by the chemical action of the gastric juice: But he adds, that for this effect it is essential that some antecedent disease render the gastric juice preternaturally rich in acetic acid.—The late *Professor Chaussier*, in the theses of *Morin* and *Laisn *, written under his direction, rejects entirely the chemical influence of the gastric juice, and ascribes the solution of the stomach to a morbid action of erosion or ulceration developed on the inner surface of the organ.—*M. Cruveilhier*, in his writings on the gastritis and enteritis of children, with gelatiniform disorganization of the gastro-intestinal mucous membrane.—*M. Louis* in his treatise on softening of the mucous membrane of the stomach, with attenuation and destruction of that membrane,—and also *M. Broussais*, agree with *Chaussier* in denying to the chemical action of the gastric juice any power of producing the various alterations in question, and likewise in ascribing them to a morbid action of an inflammatory nature.—*M. Andral* is less exclusive than the preceding authors. He does not deny the possibility of perforation of the stomach by the chemical action of the gastric juice, but appeals to new facts in support of that opinion; and believes, that, for the production of such perforations, the stomach must have been previously brought into some peculiar morbid state, by which it is predisposed to undergo the process.—*M. Bernard*, in a thesis “on the spontaneous perforations of the stomach observed in persons who die in consequence of violent pain or great surgical operations,” ranks acute affections of the mind among the occasional causes of these perforations.—Lastly, *Dr John Gair ner* of this city has mentioned several cases of erosion and perforation of the stomach in infants, and appears inclined to adopt *John Hunter's* view of their nature.

Mr Carswell concludes the historical part of his subject, by observing, that the more general opinion at the present time is to doubt the possibility of perforation of the stomach being caused after death by the chemical action of the gastric juice; while, in his own opinion, the facts hitherto collected on the subject furnish five arguments to prove this possibility.—1. Spontaneous erosions and perforations are generally observed in the great sac of the stomach, which is exactly the place where the fluids proper to this organ must accumulate in the ordinary position of the body. 2. When the erosion or perforation is attentively examined, it presents traces as if it had extended itself from a central part where the dissolving liquid rested, towards the parts to which the fluid must flow on mechanical principles; and if the solution affects organs adjoining the stomach, these are only the organs in contact with the great sac. 3. In the extension of the erosions and perforations there is no sign of any inflammatory or other morbid process,—no redness, no adhesion, no formation of pus,—no deposition of lymph; and this is the chief circumstance which establishes

a difference between perforations accomplished chemically after death, and those which take place during life by a process unequivocally morbid. 4. Most generally in perforations produced chemically in the dead body, no effusion is perceptible in the abdomen; and it is difficult to conceive how such effusion should not occur if the perforation had taken place during life, more particularly when the individual had violent fits of vomiting. 5. and lastly, these perforations have been observed most remarkably in persons who died suddenly while in a state of good health.

The second part of the paper consists of experiments performed by Mr Carswell, by which he was enabled to produce erosions and perforations in the lower animals at will. These experiments were made with rabbits. The animals were killed by a blow on the head after they had eaten a meal, and at an interval after it when digestion might be expected to be in full activity. They were then hung up by the hind-legs between five and nine hours. In such circumstances he invariably found the great curvature of the stomach, that is, the most depending part, where the digestive juices consequently accumulate, more or less altered. According to the interval which had elapsed after death, the coats of the stomach were either softened only, or completely perforated; and in the latter case the softening often extended to the adjacent organs, such as the liver, spleen, and diaphragm. The food, too, which was contained in the stomach, was always more altered in the great sac of the organ than any where else. Not only were the adjacent organs softened, where they were in contact with the perforation of the stomach, but likewise the same softening was even observed in other organs which simply touched the stomach, and which had received only by imbibition the fluid contained in it. In all the destroyed places the blood contained in the vessels appeared black. Mr Carswell considers these experiments prove, that the softening, erosion, and perforation of the stomach, referred by authors to diseased actions, are nothing else than chemical solutions by the gastric juice.

On examining the liquid found in the stomach of the animals which were made the subject of experiment, he found that its quantity was always in proportion to the extent of destruction effected, and that its acidity was very strong, to judge from its sour smell and its powerful action on litmus. To this acidity Mr Carswell ascribes its solvent power. And in fact, on placing in the intestines, bladder, or stomach of dead animals, portions of liquid aliment taken from the stomachs of living animals, he found these alimentary liquids destroyed the organs in which he had inclosed them.

He could not discover that any difference occurred in the production of these appearances by differences in the kind of death. But the position of the body after death was of material influence; for when the animals were suspended by the hind-legs, the destruction of the stomach was much deeper than when they were hung up by the head or laid on the belly, on the back, or on one of the sides. The author conceives the reason to be, that in the first position the blood accumulates in much greater quantity in the abdominal veins, and that, consequently, the secretion of gastric juice goes on after death.

Mr Carswell concludes his paper with the following general conclusions:—1. Softening, erosion, and perforation of the stomach frequently occur after death in animals killed during the digestion of a meal. 2. These alterations are owing to the gastric juice in its natural condition. 3. It is not necessary for their production that the gastric juice be preternaturally acid, as Jäger thought, or that the parietes of the stomach be previously brought by a diseased process to an unnatural state of softening, as Dr Gairdner supposes. 4. Acidity is the essential character of the gastric juice, and the cause of its digestive properties during life, as well as of its solvent power after death. 5. The solvent power, however energetic after death, has no influence on the stomach during life. 6. and lastly, Although certain erosions and perforations are undoubtedly the effect of morbid processes during life, Chaussier, Broussais, and others are mistaken in ascribing all such appearances to disease.

On the Effects and Treatment of the bite of the Venomous Snakes of Paraguay. (Meckel's Archiv für Anat. und Physiol. 1829, iii.)—Dr Kengger, a German physician who spent six years in South America, has published in a late number of Meckel's Archives the fullest account that has yet appeared of the effects of the poisonous snakes of South America on man, and the best method of treating them. He commences by observing that very little reliance can be placed on what travel-lers have said on the subject. Their statements are exceedingly contradictory and

206 On the bite of the Venomous Snakes of Paraguay.

at variance with the truth; which he ascribes to their information having been derived, not from personal observation, but from the stories told by the natives, who are not only very fond of "mystifying" strangers, but likewise really pay no attention to the distinction between the poisonous and harmless species of serpents. Even *Spix* in his late work on the serpents of Brazil has in this manner fallen, according to our author, into frequent error.

According to his own observations, Paraguay contains many poisonous species of serpents, which belong chiefly to the genera *Crotalus*, *Bothrops*, *Lachesis*, *Cophias*, and *Elaps*. The bite of all of them, however, has in the same circumstances the same effects. The largest snakes are *ceteris paribus* the most deadly, owing simply to their possessing the largest quantity of poison, and inflicting the deepest wound. The poison of small snakes, if accumulated in sufficient quantity, is equally poisonous with that of the largest individuals. Thus a kitten was killed in a few hours by the simultaneous bites of six small rattlesnakes only three days old, while another cat did not suffer any inconvenience from the bite of one of them only. The effects of the bite are always worst when the snake has been previously irritated; and hence it is that bites are more deadly which are received in an attempt to seize or destroy a venomous snake, than when a person comes by accident within its reach. Cold lessens very much the deadliness of the bite, partly because the poison is not secreted in the usual quantity, and partly because the animal on account of its torpor cannot bite with force. The activity of the poison for the like causes is feeble during the casting of the skin. But its effects are most energetic when the torpor produced by either of these causes has newly terminated. Bites on vascular parts are the most dangerous; also deep bites, and above all when a blood-vessel is penetrated by the fang. A considerable difference is also produced by differences in the constitution of the person bitten; weak and cachectic persons always suffer most severely; phlegmatic and courageous people suffer less than the sanguine and the timid; those whose pulse is rapid, either habitually, or at the time from previous exercise or agitation, are more quickly affected than those whose pulse is slow. Some travellers have alleged that the bite is less injurious to white creoles than to Europeans, and still less to the native Indians. But this, according to Dr Rengger, is a complete mistake; Americans, Negroes, Europeans, and half-breeds, being similarly affected in similar circumstances.

The symptoms produced by the bite differ with the virulence and quantity of the poison. In the most unfavourable circumstances life may be extinguished in a few minutes. Two instances of this nature fell under the author's immediate observation. One was the case of a native child two years old, who, while rolling in the grass before its parents' hut, was bitten by a large rattlesnake on the cheek immediately under the eye. Ten minutes afterwards Dr Rengger found it in the agonies of death, although the mother had sucked the wound forcibly and unceasingly from the moment it was inflicted. The face was pale, the eyes half closed, the mouth half open, the whole body flaccid, the extremities cold and insensible, the pulsation of the heart irregular, quivering, and almost imperceptible, the breathing slow and laborious, the skin bedewed with cold clammy sweat. In three or four minutes more a few slight convulsive movements were observed in the face, the child made three or four deep stertorous inspirations and expired. The wound consisted of two small punctures, such as a coarse needle might make, a reddish serum issued from it, and it was surrounded by some redness and oedema, produced probably by the suction. On examining the body a few hours after death Dr Rengger found the wound penetrated to the infra-orbital hole, but without wounding any visible vessel or nerve. The sinuses of the dura mater were gorged, the vessels of the pia mater injected, the membranes and ventricles of the brain free of serum, the brain natural, the lungs, right auricle, right ventricle, and *venæ cavae* gorged with blood, which, however, was not altered in appearance, the intestines healthy.—In the second instance of the same kind, a stout boy, three years of age, son of a white creole, was bitten in the left fore-arm by the *Lachesis rhombeata*; and died before Dr Rengger saw him, which was half an hour afterwards. He learned, that soon after being bitten the child complained of extreme weariness, anxiety, and thirst, vomited twice or thrice, was seized with convulsive startings of the extremities, and died precisely like the former. The teeth of the snake had both entered the cephalic vein. There was no redness or swelling round the wound. An examination of the internal cavities was not permitted.

Much more frequently, however, the poison operates by no means so swiftly, so

that reaction takes place in the body, and various phenomena ensue. In fatal cases the bite is speedily followed by great uneasiness, anxiety, and prostration, alternate flushes and paleness of the countenance, sickness, and irregularity of the pulse. At the same time, the vicinity of the wound swells and becomes blue, without proper inflammation, but from the effusion of blood in a dissolved or decomposed state. Pain in the part is not always complained of. Quick pulse, giddiness, headach, vomiting, and sometimes diarrhoea ensue; and both the vomited matter and stools are very bilious. The urine, too, from being clear, acquires a yellowish-brown colour. Profuse, cold and often partial sweats likewise occur, with burning thirst and an extreme desire for cold water and cool air, while the tongue becomes yellow and tremulous. Meanwhile the wounded limb gradually swells, and the lividity extends from the bite; the countenance acquires an earthy appearance, with the expression of excessive exhaustion; the limbs tremble, or are occasionally affected with convulsive startings; and the sensibility begins to be impaired. Signs of decomposition of the blood then make their appearance: petechiae break out, or fluid, black blood bursts from the wound, and sometimes too issues from the nose, eyes, and ears, and with the stools and urine. The patient now loses all consciousness, the pulse disappears, the breathing becomes feeble and stertorous, and at last death closes the scene. Sometimes the whole body, but especially the belly, swells up when the symptoms of decomposition of the blood commence; and in one or two instances Dr Rengger remarked bursting of the subcutaneous veins. This form of the effects of the South American snake-poison may end in so short a time as twelve hours, or not for fourteen days. In the latter case the patient generally lies in a state of imperfect stupor before the signs of decomposition of the blood approach. In the former there may be no such signs; but after death fluid blood issues from the natural openings. In cases of the slower form the spinal chord, and in detached parts the brain also, are found soft or even absolutely pulpy. A considerable quantity of red serum is effused into the cavities of the head, chest, and belly, the lungs and liver are gorged with black blood, and black gangrenous-like spots are scattered over the stomach and intestines. In the neighbourhood of the bite the cellular tissue is found to have passed into a state of gangrene, and fluid blood flows from incisions made into any of the swelled parts.

In the slighter cases of these effects, where the individual recovers, the symptoms are the same in kind, but milder in degree; and in particular the signs of dissolution of the blood are less distinct, and the vicinity of the wound, instead of becoming oedematous and blue, assumes the characters of erysipelatous inflammation, while the wound opens up and discharges red ichor. After this the constitutional derangement abates, and the disease becomes merely a local one; the fever increases somewhat; and at a period varying from the third to the seventh day, copious sweating, or bilious diarrhoea, with lateritious urine, puts an end to all immediate danger. But recovery is in general slow; the parts around the bite are often destroyed to a considerable distance, and slough away; the patient retains long a sallow cachectic look, is extremely weak, and often loses all his hair; and the sore left after the slough separates, fills up very slowly. When the bite has been inflicted on the hand or foot, the bones are sometimes stripped of their periosteum, and decrosis follows.

The treatment which Dr Rengger found most useful was of course partly topical and partly general. If the bitten part was a finger or toe he usually considered immediate amputation the most advisable local remedy. In other situations the bitten part was cut out, and scarified; and then a diluted mineral acid, ammonia, or solution of potass was poured into it. When these fluids were not at hand, he sprinkled over the scarified wound some irritating powder, such as *Cantharides*, Spanish pepper, gunpowder, or any substance calculated to excite speedy inflammation. In every case where medical assistance was procured immediately after the receipt of the bite, these precautions proved completely effectual. A tight ligature on the limb, nearer the heart than the seat of the bite, is a palliative measure, which he commonly practised till the treatment now described was put in force. When the poison had already entered the system before medical aid could be procured, his practice was always to administer a brisk emetic, as he remarked that those who vomited freely immediately after receiving the bite were much less violently affected than those who did not. After this volatile stimulants were administered, such as carbonate of ammonia; and whenever warm sweating was thus occasioned, the nervous prostration, the most urgent cause of danger, gradually abated. When sweating appeared the diffusible stimulants were discontinued, and large doses of *serpentaria*, camphor,

or infusions of such plants as contain volatile oils, were substituted. The administration of stimulants was always continued, notwithstanding the rising of the pulse, till inflammation commenced around the wound; and this Dr Rengger considers a point of material consequence in the treatment. If any symptoms appeared of a dissolved state of the blood, cinchona and ether were had recourse to, together with blistering along the course of the spine. After the removal of constitutional symptoms, the wound should be dressed with stimulant and antiseptic applications. Sometimes after the immediate constitutional and topical effects of the poison are subdued, the patient falls into a cachectic state, with a tendency to swelling of the lymphatic glands, and dropsical effusions. This cachectic tendency is best combated by tonics and diuretics.

The treatment adopted by the natives of Paraguay is of very little efficacy. They repose faith in various remedies, but obviously without sufficient grounds, as they have not learned to distinguish the poisonous from the harmless species of snakes, so that there can never be any certainty in their alleged cures. The negroes cut out the bitten part. The native Indians of Paraguay only practice suction of the wound, and lay on it what they call serpent-stone, which is made of burnt bones, chalk, or calcined clay. If the wound is on a finger or toe, they sometimes tie a tight ligature round till it mortifies and drops off. Most frequently, however, they content themselves with laying on the bite the boiled leaves, roots, or bark of various plants, which enjoy the reputation of being antidotes for snake-poison. But all these vegetable applications are completely inert; and Dr Rengger denies positively that the native Indian tribes are acquainted, as is generally pretended by travellers, with any antidote. He very judiciously observes, that, had a secret of the kind existed, it would have been sold long ago for spirits. Besides, during his six years' residence among them, he not only was unable to learn that any such secret was possessed, but likewise met with many instances where the native Indians perished in spite of all that was done by their countrymen to save them. One particular plant, which is so universally believed to be an antidote, that it is collected and distributed as such over the whole country, he found to be completely inert.

Experiments on the Transfusion of Blood. (*Rust's Magazin für die gesammte Heilkunde*, xxx. 1, 189).—Dr Dieffenbach of Berlin has lately made a very extensive set of experiments on the transfusion of blood, from which he has arrived at the following results. An animal, after a degree of hemorrhage which must otherwise prove infallibly fatal, may be revived and restored to permanent health by the transfusion of blood from an animal of the same species. Blood from animals of a different species will commonly excite some signs of returning life, but is incapable of restoring it effectually, and still less of maintaining it. Even very small quantities of blood from animals of a widely different species will cause death when transfused. The previous detraction of blood from mammiferous animals lessens the deadly effect of injecting into their circulating system the blood of birds or cold-blooded animals. Birds always die with symptoms like those of narcotic poisoning when the blood of mammiferous animals or of fishes is injected into their blood-vessels. Copious evacuations by vomiting, purging, or flow of urine, after the transfusion of blood, appear to form a sort of crisis, in consequence of which the state of the animal improves materially. Blood, by prolonged contact with atmospheric air, does not lose its restorative properties till it begins to undergo decomposition. Age, sex, and other corporeal differences have no influence on the blood, in reference to transfusion. Diseases are never transferred by transfusion of blood. Venous blood appears best fitted for the operation of transfusion.

Among the experiments which are stated in support of these conclusions, none appear so curious and interesting as those on the length of time during which the blood retains its restorative properties after being drawn from the body. Dr Dieffenbach is led from his researches to infer, that after it has been drawn for three hours, its vitality and vivifying power rapidly undergo diminution, and that life cannot be restored by blood which has been six hours drawn. Among a great number of trials, he only once succeeded in restoring an animal with blood which had been kept three hours. The animal was a strong, very old dog, into which, after being bled till it was apparently dead, ten ounces of blood were injected. Soon after the operation, violent vomiting ensued, in an hour black fetid diarrhoea followed, and for several days there was fever, want of appetite, and blackness of the feces. But the animal eventually recovered entirely.

SURGERY.

M. Roux on Excision of Diseased Joints. (Revue Médicale, Janvier 1830.)—

We need not observe to our readers, most or all of whom must have perused the papers published on this subject in our Journal by *Mr Syme*, that, although the operation of excision of the joints of the extremities has been long known in surgery as a substitute for amputation, it has been but little practised in this country till within these few years. The credit in which this operation now stands is owing in a great measure to the activity and success with which this gentleman has practised it on all suitable occasions. During his exertions to bring it into general notice here, it appears that *M. Roux* has been similarly occupied at Paris; and, therefore, although his experience of its safety and advantages is far from being so extensive, and is not altogether so flattering as that of *Mr Syme*, we conceive it important to make known the results obtained by a foreign surgeon of such celebrity.

M. Roux observes, that, notwithstanding the frequent success obtained in France by *MM. Moreau*, father and son, and by *M. Champion*, the operation continues to be held in great disrepute among his countrymen, and that he believes he may safely assert he is the only surgeon in Paris who has tried it often enough to be able to appreciate its difficulties, its inconveniences, and its advantages.

He considers that in all probability it will be right to abandon it entirely in respect to the joints of the lower extremities, and especially that of the knee. For excision here produces too much injury: There are too many accidents to dread. Once only has he performed excision of the knee, and that was against his own opinion, at the express desire of the patient, who expired in nineteen days. "Even when the operation is performed without the sacrifice of life, the preservation of such a limb will probably be more inconvenient in standing or walking than the timber leg used after amputation."

"But as for the arm,—destined in man for so many noble and important purposes, and so useful even when it has sustained serious injury, or is more or less deformed, provided the hand be preserved entire,—it is wrong not to attempt to derive all the profit possible from the excision of the diseased joints of such a member. At the elbow particularly it appears to present the greatest advantages; so that it is impossible to imagine why so many able surgeons prefer amputation. Undoubtedly excision of the elbow-joint, by which I understand the removal of the whole lower extremity of the humerus, as well as the upper end of both bones of the fore-arm, is, if not difficult, at least laborious in its execution: Fifteen or twenty minutes are scarcely sufficient for its proper performance: It leaves a very extensive wound, which suppurates abundantly, notwithstanding the greatest care to approximate and unite the flaps, which must be formed to reach the bones: And to these objections it must be added that several months are required to complete the cure. But if the limb is preserved and restored in all its functions, and if life is not more, or rather is actually less endangered than by amputation, are these disadvantages not abundantly compensated? This compensation is satisfactorily established by the following facts, which, without being in themselves more curious or important than those for which the surgical art is indebted to *MM. Moreau* and *Champion*, are at least more recent, and, I may also hope, of a nature to carry conviction with them.

"I have performed the operation of excision of the elbow four times. The first was in 1810, the last a few months ago; one in the right arm, and three in the left. Three of the patients were males, one of whom was 37, the two others 21 and 22 years of age; and the fourth was a girl of nineteen. In all, the affection of the elbow was apparently of a scrofulous origin, and had attained a very advanced state of progress; for the joint was greatly swelled and surrounded by many fistulous openings, and the operation exposed an extensive fungous degeneration of the cellular tissue, as well as disease of the articular ends of the bones. I shall not describe the special disease in each case; neither shall I relate the method of operating, which was nearly the same in all, or the ulterior treatment required for accomplishing the healing of the wound and preservation of the movements of the arm. My sole object is to state the definitive results.

"Of the four patients one only died of the accidents immediately connected with the operation. The first dressings had been removed, and the wound several times dressed anew, and suppuration had commenced in the interior of the wound; nay, several of the sutures for preserving the flaps in apposition had been also withdrawn, when hemorrhage took place from beneath the flaps. This returned repeatedly; so that at length it became necessary to think of amputation to save the patient's life.

210 *Extirpation of a Tumour from behind the lower Jaw.*

Perhaps I hesitated about it too long: Death ensued in three days. In the three other patients, there was not a single serious circumstance to complicate either the immediate or remote consequences of the operation; life was not for a single moment in danger. The cure, indeed, was not accomplished so quickly as might have been desired; occasionally too I dreaded a too abundant suppuration; it was also necessary to take measures against the retention and accumulation of pus in particular spots; and although one of the three was quite well three months after the operation, on the other hand the two remaining patients did not recover entirely for eight or nine months. But ultimately the arm was preserved in every instance; and in every instance its movements were partially recovered. Unfortunately, the patient I first operated on in 1819, was attacked with phthisis only a few months after recovering the free use of the arm, and died of this disease, the seeds of which probably lurked in her constitution before the operation was performed. The two others, of whom one had the joint cut out two years, and the second three years ago, are at present alive, and in perfect health, and follow their customary occupations at Paris. One is a grinder, and the other a mantua-maker."

We shall leave the reader to compare the preceding extract with the results obtained by *Mr Syme*, as detailed in his papers in this Journal, xxvi. 49, xxxi. 261, xxxii. 235, xxxiii. 233. It appears that of seven cases of excision of the elbow he has not lost one; that all have regained, or at the time of their dismissal were in the fair way of regaining, considerable freedom of motion in the arm; that of two cases of excision of the knee, one was recovering the use of the limb, while the other died of amputation, which was rendered necessary by the disease of the thigh-bone having been more extensive than was anticipated; and that in one instance the head of the humerus was cut away with the effect of forming a joint which promised to be useful.

Through the kindness of Mr Syme, we have lately had an opportunity of examining three of these cases. One was the case of excision of the head of the humerus, related in our 26th volume. This woman we found actively employed in washing clothes, which fact might be alone sufficient to satisfy every one that the shoulder-joint is of great use to her. The humerus is in fact moveable in every direction, and to nearly as great an extent as the natural joint. She has also the power of moving it freely and powerfully in every direction, except directly outwards from the body: And the joint is so strong, that she can raise a pitcher of water in the hand of that side; but this is rather a greater exertion than she feels it safe to make habitually. The elbow-joint and the joints of the hand and fingers are as entire as ever. The shortening and deformity of the arm are very apparent when the shoulder is naked; but when it is covered, the arm might, on a cursory examination, be very readily mistaken for a sound one.—The second case was one of the instances of excision of the elbow-joint. The operation was performed a twelvemonth ago. There is considerable freedom of movement, and the patient retains completely the voluntary power of bending the fore-arm; but has the power of extending it only in a slight degree. He can raise a heavy body with ease, can strike a straight-forward blow with considerable force, and preserves entire all the movements of the wrist and fingers. There is very little shortening of the arm.—The third case was the instance of excision of the knee-joint, mentioned in the 103d number of this Journal. There is still a small sore, with a trivial discharge under the new joint. This joint is in a state of slight permanent flexion, and admits of but trifling motion in any direction. But the motions of the ankle and toes are entire. On the whole, this case does not hold out much encouragement to practise the operation of excision of the knee-joint, and Mr Syme is inclined to form the same conclusion with M. Roux,—that a timber leg will probably be more useful than any leg which can be formed after excision of the joint.

Extirpation of a large Tumour from behind the lower Jaw. In a letter from Dr Adam Martin, Chatham.—The size of the tumour whose history is here recorded, the serious symptoms to which it gave rise, and the complete success attending its removal will I hope, render the following case not unacceptable to my professional brethren:—

Jane Woolins, aged thirty-eight, states that when a child, a small hard swelling was observed on the right side of her neck, under the base of the lower jaw. The ordinary domestic remedies for glandular affections had no influence upon it,—on the contrary, it gradually increased, and when she was about eighteen years of age it had attained the size of a double fist. She afterwards got married, and gave birth

Extirpation of a Tumour from behind the lower Jaw. 211

to several healthy children. Her last confinement was about six years ago. At this period the tumour, which had been slowly enlarging, began to increase rapidly, and on the 18th October last its site and dimensions are thus described in my memorandum-book:—The upper part of the tumour is placed over the ramus of the jaw, almost on a level with the malar bone; it reaches about three inches before, and two inches behind the ear, the tube of which is displaced upwards, whilst its lobe is pulled down and stretched over the surface of the swelling. It is attached to the whole side of the neck, being bounded before by the trachea—backwards it extends considerably beyond the sternomastoid muscle, and below it rests upon and projects over the acromion process. The mouth cannot be fully opened, and a large lobule can be felt under the root and side of the tongue. The skin is much stretched on all sides of the tumour, is very thin, and in general moveable over its surface, which is knobby, hard, and streaked with veins. From the ear to the apex of the tumour it measures $9\frac{1}{4}$ inches; and from the mastoid process to the base close by the trachea, 10 inches. Its circumference round the base is 18 inches; and round the apex 20 inches. The patient feels giddy and confused, and has constant and frequently severe headach. Within the last twelvemonths she has been seized with epileptic fits, in which she is violently convulsed. I had twice an opportunity of seeing her in this state,—once while taking a cast of the tumour, and again when she called on me the night previous to the operation.—The weight of the swelling, the immediate danger from the fits, and the probability of death from apoplexy at no distant period, rendered her situation very distressing. Mrs Woolins had frequently been the subject of surgical treatment, once in a London hospital, and repeatedly under private practitioners. Nothing effectual, however, was done for her relief. She had applied to me several years ago, but, from the difficulty which I then experienced of obtaining assistants on whom I could depend, I at that time declined operating. Circumstances being now changed, and the symptoms also more urgent, on the 22d October, assisted by Mr Cunningham, surgeon, Royal Navy, and Mr Henry Belfrage, I proceeded to the operation.

The patient being seated in bed, and the tumour supported in such a way as to prevent its pressing on the vessels of the neck, and thus inducing a fit, an oblique incision passing below the ear was made from the back part of the tumour to the trachea. The skin, together with the ear, was dissected up as far as possible, and the removal of the tumour commenced from above. A portion of it was found to dip deeply behind the ramus of the jaw, and to occupy the place of the parotid gland, which was partially absorbed. Strong ligamentous bands passing from the base of the jaw were next divided, and by cutting on the tumour, that part of it which extended under the bone close by the tongue was easily separated. A second incision, uniting with the first at its extremities, and preserving a considerable flap of healthy skin, was next made at the lower part of the tumour, which after a little dissection was completely detached. The bag of the pharynx was now seen moving during deglutition, as well as the great vessels of the neck pulsating in the bottom of the wound. Although many arteries jetted vigorously on being divided, I was rather surprised to find that when my assistant's fingers were removed from them, only one required a ligature. But, as in a case of a similar tumour on which I had operated a few days before, hemorrhage had come on after the wound was dressed, and had proved troublesome, in the present instance I stuffed the wound with lint. This was taken out in the course of the afternoon, and the edges brought in contact with stitches, compresses and a bandage. The operation occupied twelve minutes. Every thing went on favourably; she slept comfortably; the pulse never exceeded 108, and a considerable part of the wound healed by the first intention. I may here be allowed to notice, that I have found plasters invariably prejudicial to the healing of wounds when applied in the first instance, and I think that stitches are productive of more good and less mischief than are usually ascribed to them. The manner, as well as frequency of dressing incised wounds, recommended by Mr Syme in the 24th volume of this Journal, I have adopted for some time past, and have found it a great improvement on the former practice.

The patient was out at the end of a week, and returned home on the thirteenth day, with a superficial sore, not exceeding an inch in length. In the case to which I have already alluded, great difficulty of swallowing succeeded the operation for a few days. Of this Mrs Woolins never complained.—The tumour weighed four pounds four ounces and a half; was of a firm, almost cartilaginous consistence, and contained several cavities filled with bloody and serous fluid. There were, however,

no osseous depositions, several of which I met with in the other tumour, which was smaller, and occurred in an older person. Mrs Woolins has been entirely free from fits since the operation; and the only inconvenience resulting from it is slight paralysis of the *orbicularis palpebrarum* and right angles of the mouth.—ADAM MARTIN, M. D.—Chatham, November 26, 1829.

MEDICAL JURISPRUDENCE.

On Murder by Poisoning with the Mineral Acids. (*Archives Générales de Médecine*, Novembre 1829,—*Bulletins des Sciences Médicales*, Janvier 1830.)—Although voluntary and accidental poisoning with the mineral acids is exceedingly common, few instances are on record where the murderer has had recourse to these poisons, because their intense acid taste and instantaneous corrosive action render it extremely difficult, and at first view one would suppose impossible to administer them secretly. The two following judicial cases are therefore of much interest on account of their rarity.

The first is an instance of an *Attempt to Murder by administering Nitric Acid*, which came lately before the court of assizes at Paris. A man Groubel, who lived on very bad terms with his wife, filled her excessively drunk one evening at the village of Boulogne, near Paris. At half-past eight the same evening, (October,) they were seen together on their way towards the Bois de Boulogne; and next morning the dead body of the woman was found on the road side. *MM. Ollivier and Chevallier* were requested by the authorities to examine it.

Her dress was disordered. Her cap and an under waistcoat were corroded and stained, and particularly the collar and sleeves of the latter. The stains were yellow. Three similar stains were found on her petticoat. The face was pale, but much discoloured, of a lemon-yellow tint, particularly on the right side, by a fluid which issued from the angles of the mouth. Several locks of hair were similarly discoloured. At the left side of the neck towards the back and corresponding with the deepest stain on the waistcoat there was a grayish superficial eschar surrounded by some reddish excoriations. On various parts of the forehead, on the right side of the nose, behind the right ear, and on the right side of the neck near the front there were several excoriations exactly such as those made by finger-nails; and two on the neck were accompanied with slight ecchymosis. Several ecchymosed spots were also found on the back of the head, on the back of the right shoulder, and on the outer part of the right fore-arm. On the fore part of the same fore-arm three grayish, superficial eschars were seen, exactly like that on the neck. *The hands were not at all stained.*—The whole inside of the mouth was of a deep lemon-yellow colour; the fine skin of the lips excoriated; that of the tongue shrivelled. The pharynx was full of bloody mucus and also yellow, which colour farther affected the upper quarter of the gullet, but became less and less distinct downwards. The lower part of the gullet and the whole stomach were healthy, and the latter was filled with half-digested food and much wine. The larynx, trachea, and bronchi, were healthy, their mucous membrane white; but both lungs had a blackish or violet colour; the left was scarcely crepitant at its upper portion, and very hard, red, and hepatized at its lower part, with tubercles in the centre of the hepatization, and it yielded a great quantity of black fluid blood when cut into; the right was less strongly hepatized, but equally full of fluid blood. The heart was soft and flaccid; and its cavities contained much fluid dark blood. The brain was much injected, and the veins gorged.

The stains on the clothes were analyzed in the following manner. Litmus paper was strongly reddened by them. When a portion of the stained cloth was immersed in distilled water, the water became acid, and when this was neutralized with bicarbonate of potass, and concentrated, a piece of paper immersed in the solution and dried, burnt with a sparkling redness like match-paper. Another portion of the liquid evaporated to dryness, and treated with a little concentrated sulphuric acid, gave out fumes of nitric acid. Another portion evaporated to dryness, and projected on burning charcoal, caused deflagration. The stains of the skin and hair were subjected to the same process, and gave the same results. A portion of the yellow stain, when treated with caustic potass, became reddish-yellow. These experiments left no doubt that the stains on the body and clothes were caused by nitric acid. The contents of the stomach were carefully analyzed in like manner, but no nitric acid could be detected in them.

The prisoner being arrested about the time when the body was examined, the medical inspectors requested to be allowed to examine him; upon which several yellow stains were found on his coat, trousers, and hands. These stains were analyzed in the same manner with those found on the woman's clothes and body; and nitric acid was detected in them.

The opinion of *M.M. Ollivier and Chevallier* was, that the woman did not poison herself,—that an attempt had been made to make her swallow nitric acid, which, however, she had rejected before it reached the stomach,—that she did not die of poison,—and that in all probability she had been suffocated by the hands applied on the neck and over the mouth and nose. The want of stains on the woman's hands, with the abundance of them on other parts of the body, justified the conclusion that she did not take the poison herself. The entire state of the alimentary canal, they conceive, also bears out the inference, that she did not die of the poison; but here it appears to us that more care should have been taken to determine, that the glottis did not suffer, so as to produce death by suffocation. That she was smothered or choked they consider is rendered highly probable by the scratches round the mouth and on the neck, by the gorged state of the lungs, and black fluid condition of the blood. Lastly, they give their opinion that the prisoner was the person who administered the poison, and subsequently choked her; and they appeal in proof of this to the stains on his clothes, but more particularly on the palms of his hands.

The whole case is an exceedingly instructive example of the advantage to be derived in obscure crimes from a thorough medico-legal investigation by competent persons. In support of the doubts we have expressed whether the woman might not have died of suffocation from the acid attacking the glottis we may mention, that *M. Alibert*, who was examined in the case, stated he had seen several instances of this kind of death, where the acid had not penetrated beyond the back of the throat. *M. Ollivier* seems to doubt the facts here stated; but without reason. Many years ago an opinion in favour of death by poison was given by one of the Prussian Colleges in the case of a child where the poison did not reach the stomach, but manifestly produced violent inflammation of the rima glottidis, epiglottis, and larynx.*

The other case is an *Attempt to Murder by administering Sulphuric Acid*, which was the subject of trial lately at Strasbourg. An hospital servant of the military hospital of that town, wishing to get rid of his wife, administered a potion with a strong dose of tartar emetic, and subsequently persuaded her to take several spoonfuls of sulphuric acid, under pretence of relieving the vomiting. Violent symptoms were consequently produced, and a judicial inquiry was therefore set on foot. Sulphuric acid was found in a syrup of which the man had administered a part, and besides, the administration was proved by an acid stain on the bed-cover, and the corrosion of an iron spoon in which it had been given. The woman, who eventually recovered, gave very gentle evidence against her husband. After a trial which lasted seven hours, the jury found the man guilty by a majority of seven to five, and the judges uniting with the majority, the prisoner was condemned to death.

While on this subject we may mention that some important observations have been lately made by Dr O'Shaughnessy, a graduate of this University, on the tests for nitric acid. He finds that Liebig's test for this acid in a free or combined state, which has been introduced into almost every chemical work of note published since his announcement of it, is so open to fallacy, that no reliance can be placed on it in any medico-legal inquiry. Sulphuric acid and muriatic acid in somewhat larger proportion to the blue solution of indigo than is required in the instance of nitric acid, will effect a complete decolorization of the test; and we have since been informed by him, that muriate of iron, and even muriate of soda, possess the same property. He likewise makes some objections to the use of the test derived from the deflagration of combustible substances with the neutralized acid, and even to that derived from the action of the acid on certain metals, such as tin or copper. As to the latter test, we do not exactly see that it is liable either to fallacy or to any difficulty in the way of applying it; but the former property, as he remarks, certainly does not distinguish

* Augustin's Repertorium, i. ii. 15.

nitric acid from chloric acid ; and, on the whole, he is probably correct in supposing that any of the three properties now to be mentioned is more characteristic,—the orange colour struck by the acid with morphia,—the formation of fulminating silver,—and the crystallization of nitrate of urea in a concentrated solution of urea. Of these we should consider the last as by far the most characteristic and elegant test. In compound organic mixtures he recommends the following method of analysis for detecting small proportions of nitric acid :—First filter the mixture, water being added if necessary ; then throw down the gelatin if there is reason to suppose any present by means of tannin ; next neutralize with carbonate of potash and boil with animal charcoal ; filter again and gently evaporate to dryness. Of the remaining mass introduce one drachm into a small retort of the capacity of two ounces, add an equal weight of concentrated sulphuric acid, and apply a distilling heat,—the product being condensed in a small receiver by means of a few drops of distilled water. With the fluid thus procured try any or all of the three tests mentioned above, the coloring of morphia, the formation of fulminating silver, and crystallization of nitrate of urea.

Poisoning with Empyreumatic Oil. [*Journal Universel, Novembre 1829.*]—In the 21st volume of the *Dictionnaire des Sciences Médicales*, p. 605, the late Professor Chaussier has related a case of poisoning with the oil of Dippel, or rectified empyreumatic oil of hartshorn ; and states that, on the patient taking a spoonful by mistake, death ensued instantly, and no morbid appearance could be discovered in the dead body. Another case of poisoning with the same substance is related by *M. Duret* in the *Journal* quoted above ; but in this instance the effects were very different. The subject was a widow, thirty years old, who, after unsuccessfully trying to procure arsenic, swallowed an ounce and a-half of the empyreumatic oil of commerce, from which the oil of Dippel is procured by rectification. No one witnessed the symptoms which resulted. But it appears she vomited copiously, had drunk a great deal of water, but, finding the effects of the poison not so speedy or so supportable as she desired, had put an end to her sufferings by jumping into a well. The dead body exhaled the peculiar fetid odour of the oil. The lips were pale, as well as the lining membrane of the palate and tongue, which was hard, shrivelled, and on the edge thin, and fringed. The velum, pharynx, and gullet, presented the same colour and shrivelling. The stomach was full of liquid. Externally, it had a diffuse rose-red tint, crossed by numerous, distended, black veins, which here and there had burst, and caused small circumscribed patches of extravasation. The liquid contained in the stomach consisted of remains of food, water, a considerable quantity of the poison, and some extravasated blood. The villous coat had a punctuated redness, was unnaturally thick, and presented very prominent rugæ, but no appearance of erosion. The intestines were also inflamed, but to a less degree than the stomach. This substance, therefore, appears to have acted as an acrid poison, while in the case mentioned by Chaussier, it seems to have acted like one of the most powerful narcotics, such as the empyreumatic or essential oil of tobacco.

Poisoning with Cantharides-powder. (*Annales de la Médecine Physiologique, Octobre 1829.*)—Although this species of poisoning is common, few accurate cases have been recorded. The following, therefore, possesses considerable interest.—*M. Rouquayroul*, the relater of it, was called to visit a shoemaker, who, amidst apparently acute suffering, declared he had vomited his entrails, and pointed them out to his physician. He had an acute sense of burning in the mouth, throat and stomach, pains in the region of the kidneys and bladder, and constant desire and inability to pass urine. The mouth was all excoriated, and ptyalism had commenced ; the tongue was tremulous ; the pulse frequent and contracted ; and there was some prurism. The vomited matter contained fragments of mucous membrane and particles of powder of cantharides. Three hours had elapsed since the patient had swallowed the poison, the dose of which was unknown. Half a pound of olive oil was immediately administered, and then twenty grains of ipecacuan, which were followed by free vomiting ; and a large quantity of cantharides-powder was mingled with the matter discharged. Soon afterwards two pounds more of olive oil were taken, and in half an hour two ounces of castor oil ; after which he had copious stools containing can-

tharides in large quantity. The same treatment was in no long time again repeated with similar effect. In the evening there was convulsive starting of the arms and legs, continual priapism, bloody urine, febrile heat of the belly, a quick contracted pulse, and *subultus tendinum*. The olive oil was repeated by the mouth, and also administered by way of injection; but the pains in the throat, stomach, kidneys, and bladder continued without abatement; and, therefore, ten leeches were applied to the throat, twenty to the epigastrium, and as many to the perinæum; and when the leeches had all dropped off, the man was placed in the warm-bath, where he remained three-quarters of an hour. Next day the urine continued bloody; the eyelids were closed; the patient was in a state of constant agitation, and was kept in bed only by constraint; but the pulse was more full; and the pain chiefly complained of was in the region of the bladder. Thirty leeches were accordingly applied to the hypogastrium, emollient injections were given, and the warm-bath was repeated. In the evening the urine was less bloody, the pains abated, and the vomiting intermitted for some time. At length he vomited, with great pain and the discharge of some blood, the entire mucous membrane of the gullet. It was torn into strips at its two ends; and an inch and a-half of its central portion was uninjured. The outer surface exhibited capillary vessels running longitudinally, with plaits or wrinkles in the same direction; and on its inner surface there were still some fragments of cantharides.—Next day, (the third,) deglutition was extremely painful; but the other pains had abated, and the urine was less bloody.—On the fourth day, the tongue was tremulous, and red on some points; the ptyalism continued, and the act of swallowing was attended with extreme pain; but the urine was natural, the priapism had ceased, there was no longer any pain in passing urine, and the patient felt so well and cheerful that he wished to rise. Milk, beef-tea, sweet gargles, emollient injections, and the warm-bath were given.—On the fifth day there was no longer any fever or heat in the mouth. The mucous crypts secreted a fluid so viscous that it hung from the mouth in strings a yard and more in length.—On the eleventh day there was pain in the gullet exciting cough, pricking pain in the rectum, and a little diarrhoea.—On the thirteenth the tongue was less red but still tremulous; the patient could swallow solid food easily, but still felt difficulty in swallowing liquids; the ulcers of the mouth were healed, from which it was inferred that those of the gullet were healed also. After this *M. Rouquayroul* visited him occasionally, and found all his functions wonderfully perfect.

It may be thought that the supposed mucous membrane of the gullet discharged in this case was nothing more than a pseudo-membrane, the result of inflammation of the mucous coat; and such, undoubtedly, is the nature of the membranous matter discharged in many forms of irritant poisoning, and often hastily considered to be fragments of the inner coat of the alimentary canal. But in the present instance, the relater maintains that its nature could not be mistaken. In particular, it presented many regularly ramified vessels in its substance; and one of these was so large, that he succeeded in procuring blood from it by pricking it with the point of a lancet.

Oil, which was profusely used in this case, is not considered a proper article in the treatment of poisoning with cantharides. The experiments of *Pallas*, confirmed by those of *Orfila*, show that it is, on the contrary, injurious, by dissolving the active principle of the poison.

On the Poisonous effects of certain spoiled articles of Food. (*Archives Générales de Médecine*, *Fevrier 1830*.)—It is well known that certain articles of food have been frequently observed on the Continent to acquire poisonous qualities of a peculiar kind, and in a way which chemists and physicians have not hitherto been able to explain very satisfactorily. Among these articles the most frequent are a peculiar variety of sausage, and a particular kind of cheese used in Germany; but both in France and Germany bacon and ham have been also several times found to acquire poisonous qualities analogous to those which characterize the sausage-poison and cheese-poison. A very elaborate inquiry into an accident supposed to have arisen from spoiled ham has just been published by *M. Olivier* in the *Archives Générales de Médecine*. His investigations set completely at rest the common notion that such accidents arise from the accidental impregnation of the meat with metallic poisons; but he has not succeeded in discovering the real cause.

In the instance which gave rise to his investigation, the master of a family purchased a ham pye at a pastry-cook's in Paris; and the whole family ate the meat

of the pye the same day, and the crust on the following day. Three hours after dinner the master of the house was seized with general uneasiness, followed by cold sweats, shivering, violent pain in the stomach, and frequent vomiting; then with burning thirst, extreme tenderness of the belly, so that the weight of the bed-clothes could scarcely be borne, profuse purging, and colic of extreme violence. His daughter, twenty-seven years of age, and a child nine years old were similarly attacked. A physician who was called to their assistance soon after they were taken ill, drew up a minute report of the symptoms in each of his patients, and declared that they had a violent inflammation of the stomach, which he was inclined to ascribe to natural verdigris, or the carbonate of copper having been communicated by the pastry-cook's moulds. In a few days all the three individuals recovered under an antiphlogistic treatment. About the same period several accidents of the like nature occurred among the customers of this pastry-cook; and in consequence a judicial investigation was ordered. The shop being properly inspected it was found that every operation was conducted with due attention to cleanliness. *MM. Ollivier and Barruel* were appointed to analyze the remains of the meat which produced the cases first mentioned, as well as the alvine discharges of the child.

The alvine discharges had a leek-green colour, and were not fetid, but of a sour smell. Sulphuretted-hydrogen did not induce any change in colour; neither was any change of colour produced by the same reagent after the fluid was filtered. The remains of the pye had become mouldy. The meat and paste were separately examined. The contact of sulphuretted-hydrogen did not produce any change of colour in either. When they were incinerated in a crucible, and the residue treated with diluted nitric acid, the filtered liquid on being neutralized with ammonia did not give any precipitate with ferrocyanate of potass, or with sulphuretted-hydrogen, and did not become blue with ammonia. Another portion of the remains of the pye was treated with alcohol and a few drops of acetic acid, and the alcoholic solutions were evaporated to the volume of half-a-drachm. The residue was agitated with four times its volume of distilled water, filtered and evaporated, and dissolved again in water. This solution was not affected by sulphuretted-hydrogen or by nitric acid. These experiments furnish ample proof that the pye did not contain a trace of arsenic, copper, antimony, or lead. The only conclusion, therefore, which *M. Ollivier* conceived it possible to draw was, that the ham had in some way or another acquired the poisonous properties sometimes remarked in German sausages, cheese, and ham.

Poisoning with Bismuth. (Bulletins des Sciences Médicales, Février 1830.)—The subnitrate of Bismuth, or Magistery of Bismuth, the common oxide of Bismuth of the Pharmacopœia, has been long supposed to be a poison, and was fully proved to be so by the experiments of Orfila. The following case, recently extracted by *M. Ferussac* in his Journal from the Heidelberg *Klinische Annalen*, is the only instance with which we are acquainted of fatal poisoning from this salt, and fully establishes the propriety of arranging it with the active irritants. A man who had been in the habit of receiving from his surgeon chalk and magnesia for pyrosis, received the subnitrate of bismuth by mistake from the village-barber, who kept an old medicine chest, and took about two drachms of it suspended in water, along with a little cream of tartar. He immediately felt burning pain in the throat; violent vomiting and purging soon followed; and next day *Dr Kerner* of Weinsperg, who relates the case, was called to his assistance. He found him affected with dreadful nausea, frequent brown vomiting, watery purging, an intermitting pulse, general coldness, and spasmodic contractions of the muscles, particularly of the legs. The back of the throat and uvula were inflamed; there was burning pain there, with difficulty in swallowing; the membrane of the nose was dry, the tongue covered with a dirty-yellow crust; and the patient complained of unquenchable thirst, and a constant nauseous taste.

The vomiting and diarrhoea having already lasted eleven hours, *Dr Kerner* concluded that the poison was already all expelled, and confined his attention therefore to the treatment of the consecutive effects: Emulsive mixtures were administered with a little laudanum, and the warm bath was then employed with some advantage; the spasms abated, the pulse became firmer, and the patient passed the subsequent night tolerably.—On the morning of the third day, however, the pain in the throat and difficulty in swallowing became much worse; the patient complained of constant nausea, metallic taste, and hiccup; and the hands and face be-

gan to swell. Leeches were applied to the neck, with some relief to the throat. But in the afternoon the skin became hot, the sight dim, the breathing laborious; and it was then discovered that no urine had been discharged from the time the poison was swallowed.—On the fourth day he complained much of tension, and extreme dryness of the palms and soles; the lower belly began to swell; and the patient was extremely weak and despondent.—On the fifth day there was more fever, some tenderness of the belly and increased hiccup, with augmentation of the saliva, which was brown, and of a metallic taste. He was this day bled from the feet, and cataplasms were applied to the belly. The blood was florid-red and slightly buffy.—On the sixth there had still been no urine passed, and none was secreted. Some symptoms of delirium, with tremors, made their appearance.—On the seventh the lower belly was enormously distended; the stools were extremely fetid; the tongue was so swelled that the throat could not be seen; the thirst and heat in the throat were excessive; and the man remarked constantly a smell like that of the sea-shore.—On the eighth the urine for the first time began to flow, and was very pale. The fever went on increasing, and became attended with strong delirium; the respiration was more and more embarrassed; and the patient, in reply to questions, said he was quite well. In this state he lingered till the night of the ninth day, when he expired.

On inspection of the body, the alimentary canal was found affected along its whole course from the back of the mouth to the rectum; and in this long tract there were but few points quite healthy. The tonsils, the uvula, the back of the throat, the epiglottis and the inner membrane of the larynx were gangrenous. The gullet was livid, but not inflamed; the stomach was strongly inflamed, especially in its great sac, the mucous coat being as it were macerated and detachable with extreme facility from the subjacent coat, which was covered with purple-red papulæ. The whole intestinal canal was much distended by gases, more or less inflamed, and here and there gangrenous. The gangrene was particularly well-marked at the rectum. The whole intestinal mucous membrane was very easily detached. The lower end of the spinal cord and inner surface of the heart were also inflamed. The lungs were healthy, but the windpipe checkered with blackish points. The kidneys and brain were in the natural state.

MEDICAL STATISTICS.

Extracts from the Parisian Bills of Mortality for 1828. [*Annales d'Hygiène Publique et de Médecine-Légale. Janvier 1830.*] The deaths in Paris in 1828 were 24,299, being 1058 above those of the preceding year. Of this number 11,430 were males, 12,859 females.

The disease which has been the most prolific source of mortality is *phthisis pulmonalis*; 2659 persons, of whom 1133 were males and 1526 females, perished from this scourge of humanity. The time of life within which these deaths occurred was from the fifteenth to the forty-fifth year in females, and from the twentieth to the thirty-fifth in males.—With *phthisis* may be arranged *Chronic Pulmonary Catarrh*, a disease nearly as prevalent after middle age as *phthisis* before it: 1539 persons died of it, of whom 688 were males and 851 females.—*Gastritis* was the occasion of 2046 deaths, 922 males, and 1024 females. The prevalent age was childhood. The same may be said of *Enteritis*, which proved fatal to 2230, of whom 1108 were males and 1122 females.—*Peritonitis* caused 141 deaths among males and 407 among females: The prevalent age was during the first fifteen years of life in males, and between fifteen and forty-five in females.—*Inflammation of the brain or its membranes* was fatal to 254 males and 206 females, and it occurred chiefly either in the first three months of existence or between the fifteenth and sixty-sixth years.—*Inflammation of the lungs* accounts for 2211 deaths, the males being 1042, and the females 1169; and the ages at which it prevailed most was in the first three years of life, or above the age of fifteen.—*Apoplexy* proved fatal to 907, of whom 477 were males, and 430 females.—*Scirrhus, cancer* and *cancerous ulcers* occasioned death in 715 instances, of which 174 were men and 541 women; and the prevailing age was above thirty.—*Aneurism of the heart* was fatal to 223 men and 286 women above the age of twenty.

Fever, as the cause of mortality, are thus circumstanced. *Cerebral fever* carried off 339 males and 340 females, chiefly between the sixth month and sixth

year; *Typhoid* or ataxic fever 97 males and 95 females; *Bilious fever* 66 men and 54 women: and these two last varieties attacked nearly all ages equally above the fifteenth year.

Among the diseases of infancy *Convulsions* occupy the most prominent place as the cause of death: 889 boys and 852 girls perished from convulsions, chiefly in the three first months of life, and between the first and fourth year. *Dentition* proved fatal to 154 boys and 161 girls; *Measles* to 120 boys and 202 girls; *Small-pox* to 85 boys and 35 girls; *Croup* to 77 boys and 75 girls. *Premature* and *Still-births* amounted to 1246, of which 682 were males and 564 females; and the number of deaths in the first three months from mere original weakness was 513, of which 215 were males and 298 females.

A very striking circumstance here developed, and one which has been remarked before, is the much greater frequency of phthisis among females than among males. Taking phthisis and the corresponding disease after middle age, pulmonary catarrh, we find that for 1821 male deaths there were among females 2377, which is nearly in the proportion of two to three.

On the difference in Mean Longevity between the Rich and Poor. (*Annales d'Hygiène Publique et de Médecine-Légale, Avril 1830.*)—In the 20th volume of this Journal, p. 212, a notice has been introduced among the articles of Medical Intelligence from the researches of M. Villermé of Paris, on the relative mortality and longevity of the rich and poor orders of society in the French capital; and from that notice it appears, that in the *arrondissements* of Paris inhabited chiefly by the rich, the annual mortality is from one in 43 to one in 54, while in those inhabited chiefly by the poorer ranks the mortality is so great as one in 24 or 25. This inquiry has been since taken up by M. Benoiston de Chateauneuf, who arrives at the same conclusion from different data. He restricts his researches to the very highest and the very poorest ranks.

For data as to the mortality of the former he takes the various princes of Europe, —the great church dignitaries, comprehending the whole cardinals, and the archbishops and bishops of France,—the peers of France and England,—and the lieutenant-generals, vice-admirals, presidents of the higher courts, directors general, ministers and councillors of state in France. These at the beginning of 1820 formed a body of 1600 persons, whose ages extended from twenty to ninety-five,—namely, 53 between twenty and thirty, 157 between thirty and forty, 370 between forty and fifty, 391 between fifty and sixty, 361 between sixty and seventy, 189 between seventy and eighty, 78 between eighty and ninety, and one above ninety. The number of these individuals who died in the each of the ten years ending with 1829, was 57, 47, 49, 56, 61, 61, 46, 51, 50, 44; which taken together form one-third of the whole. The mortality at different ages was as follows: Of those between the ages of thirty and sixty, about *three and a-quarter per cent.* died annually; between sixty and eighty, *eleven and two-thirds per cent.*; above the age of eighty, *thirteen and a-quarter.*

The other term of comparison is procured by taking 2000 of the inhabitants of the 12th *arrondissement* of Paris, where the workmen belong almost entirely to laborious trades, and are so poor that at least three-fourths of them die in the hospitals. Among these 2000 individuals M. Benoiston-de-Chateauneuf found, that of persons between the ages of thirty and sixty, *seven and a-quarter per cent.* die annually; between the ages of sixty and eighty, *twenty-one and nine-tenths*; and above eighty all died within one year. The relative mortality at shorter intervals of ages will appear from the following table, where the first line indicates the intervals of age, the second the annual per centage of deaths in the richest order of society, and the third the annual per centage in the poor ranks.

| | 30 to 40 | 40 — 50 | 50 — 60 | 60 — 70 | 70 — 80 | 80 — 90 |
|-------|----------|---------|---------|---------|---------|---------|
| Rich, | 1.08 | 1.17 | 1.99 | 3.60 | 8.04 | 13.22 |
| Poor, | 1.57 | 2.13 | 3.59 | 7.50 | 14.36 | 100.00 |

It appears from an important document, printed a few months ago by the Faculty of Advocates of Edinburgh, that in that body, consisting of individuals who enter it not younger than 21, and on an average at the age of 23 or 24, the expectation of life, or the number of years which they live one with another after their admission, is 40 2-11ths nearly. This calculation is taken from the lives of 210 individuals,

Hunterian Medal—Harveian Society of Edinburgh. 219

the whole of whom entered before the year 1766 ; and since then it is well known that the average duration of life has been considerably improved. Among the 210 individuals, 118 survived their entrance (at the age of 24) 40 years or upwards ; of these 118, 29 survived between forty and forty-five years ; 25 between forty-five and fifty ; 25 between fifty and fifty-five ; 17 between fifty-five and sixty ; 13 between sixty and sixty-five ; 8 between sixty-five and seventy ; and one survived 72 years.

HUNTERIAN MEDAL.—A Gold Medal, of the value of 10 guineas, having been placed at the disposal of the Council of the Hunterian Society for the best Essay on any subject selected by them, they have chosen for the current year, "The Nature and History of Tubercular Formations." Essays must be delivered before the 1st of December. They must be addressed to the Secretaries, and the name of the author, with a motto corresponding with one prefixed to the Essay, enclosed in a sealed packet. The merits of the Essays will be adjudged by the Council, and the Prize presented at the Anniversary Meeting in February.

The competition is not limited to Members of the Society, but is open to the profession generally.

J. T. CONQUEST, }
W. COOKE, } *Secretaries.*

18, *Aldermanbury*,
March 10th, 1830.

HARVEIAN SOCIETY OF EDINBURGH.—At the Annual Business Meeting of the Harveian Society of Edinburgh, held on the 12th instant, it was decided that the best Essay given in on the subject advertised last year, viz.—"The Diagnostic properties of the Stethoscope, illustrated by Dissections," was the one bearing a Motto from Bertin ; and on opening the corresponding sealed Letter, it was found that Robert Spittal, Esq. one of the clerks of the Royal Infirmary of this city, was the author ; consequently Mr Spittal was declared the successful competitor.

The Harveian Society has fixed on the following subject for the Prize Essay for the year 1831, viz.—"The proximate Cause, and most appropriate Treatment, of Tetanus."

Dissertations on this subject must be transmitted to the Secretaries (at No. 8, George Square, or 7, York Place) on or before the 1st day of January 1831. Each Dissertation must be accompanied by a sealed Letter, containing the Name and Address of the Author, and marked on the back with a Motto. The same Motto must also be prefixed to the Dissertation to which the Letter belongs.

The Prize given by the Society to the successful Candidate, is either a copy of the Quarto Edition of Dr Harvey's Works, published by the College of Physicians of London ; or a Silver Medal, with a suitable Inscription, at the option of the Candidate. The Prize is presented to the successful Candidate, at the Annual Festival in April.

The Candidate is at liberty to employ his Dissertation afterwards, in any way he may think proper : And, accordingly, some Dissertations, presented to the Harveian Society, have, in consequence of publication, been productive of considerable honour and emolument to the Authors.

By order of the Society,
RICHARD HUIE, M. D.
WILLIAM MONCREIFF, M. D. } *Secretaries.*

EDINBURGH,
23d March 1830.

THE
EDINBURGH
MEDICAL AND SURGICAL JOURNAL,
 No. CV.
 CONTENTS.

PART I.—ORIGINAL COMMUNICATIONS.

| | PAGE |
|--|------|
| ART. I. Fifth Quarterly Report of the Edinburgh Surgical Hospital from 8th April to 8th August 1830. By JAMES SYME, Esq. | 221 |
| II. Observations to endeavour to ascertain if Dead Animal Matter absorbs Air on exposure to the atmosphere;—and if the Putrefaction of Animal Matter is attended with an elevation of Temperature. By JOHN DAVY, M. D. | 243 |
| III. Observations on the Actions of the Heart. By WILLIAM STOKES, M. D., and JOHN HART, M. R. S. A. | 260 |
| IV. Notes upon the Medical Topography and Diseases of a district of the County of Donegal. By HENRY MAUNSELL, | 273 |
| V. An Inquiry on the chemical solution or digestion of the coats of the stomach after death, with some observations on softening, erosion and perforation of the stomach in man and animals. By ROBERT CARSWELL, Esq. | 282 |
| VI. Contributions to Pathology and the Practice of Physic. By Dr HENDERSON, and Messrs GRAHAM, LAWRENCE, RANKEN, and BODKIN. | 312 |
| VII. Case of Lithic Acid Urinary Calculus successfully removed by Lithotripsy at the Greenwich Hospital. By R. DOBSON, M. D. | 323 |
| VIII. Remarks on the Treatment of Amaurosis by Strychnine, with several successful Cases. By THOMAS SHORTT, M. D. | 415 |

PART II.—CRITICAL ANALYSIS.

| | | |
|----------------|---|-----|
| ART. I. | 1. Des Fièvres Puerpérales observées à la Maternité de Paris, pendant l'année, 1829, &c. &c.—On the Puerperal Fevers observed at the Lying-in Hospital of Paris, during the year 1829; and on the various methods of treatment employed, particularly mercury, emetics, and blood-letting. By M. TONNELLE'. 2. Résumé de la Clinique Médicale, &c.—Account of the Course of Clinical Medicine in the Lying-in Hospital of Paris, for the January Quarter of 1830. By A. DUPLAY. 3. De la Phlébite Utérine, &c. On Inflammation of the Uterine Veins and of the Veins generally, considered chiefly in respect to its causes and its complications. By M. DANCE. 4. Mémoire sur le Rammollissement, &c.—An Essay on Softening of the Uterus. By S. G. LUROTH, M. D. | 328 |
| II. | 1. On the Diseases and Injuries of Arteries, with the operations required for their Cure; being the substance of the Lectures delivered in the Theatre of the Royal College of Surgeons in the spring of 1829. By G. J. GUTHRIE, F. R. S. 2. On Aneurism and its Cure by a new Operation. Dedicated by permission to the King. By JAMES WARDROP, Esq. | 349 |

b

| | PAGE |
|---|------|
| III. An Inquiry concerning the Indications of Insanity, with suggestions for the better protection and care of the Insane. By JOHN CONNOLLY, M. D. | 370 |
| IV. 1. <i>Nouvelles Recherches sur l'origine, &c.</i> An Inquiry into the Origin, Nature, and Treatment of the Vesicular Mole, or Hydatid Pregnancy. By MADAME BOIVIN. | |
| 2. <i>Recherches sur une des Causes, &c.</i> An Inquiry into one of the most frequent and least known Causes of Miscarriage, with a Memoir on the Intro-pelvimeter,—the Prize-Essay of the Royal Medical Society of Bordeaux. By MADAME BOIVIN, | 380 |
| V. A Treatise on the Venereal Diseases of the Eye. By WILLIAM LAWRENCE, F. R. S. | 393 |
| VI. A Treatise on Poisons, in relation to Medical Jurisprudence, Physiology, and the Practice of Physic. By ROBERT CHRISTISON, M. D. | 406 |
| VII. Introductory Lectures to a Course of Military Surgery, delivered in the University of Edinburgh. By GEORGE BALLINGALL, M. D. | 412 |

PART III.—MEDICAL INTELLIGENCE.

| | |
|---|-----|
| On the Cause of the Entrance of Air into the Veins during Operations on the Neck, | 427 |
| On the Animal Temperature in different Latitudes, | 428 |
| On the influence of atmospheric temperature on the Mortality among Infants, | ib. |
| Nature of the Urine during the formation of the Cystic Oxide Calculus, | 429 |
| Alleged discovery of a substitute for Sulphate of Quina, | 430 |
| Caution as to the use of the Hydriodate of Potass, | ib. |
| On the Poisonous effects of Oxygen and some other Gases on the Animal Body, | 431 |
| Cases of Poisoning with Coal Gas, | 433 |
| On Poisoning with the Compounds of Mercury, | 434 |
| Statistical Account of the state of Pharmacy in Paris, | 436 |
| New Mineral Spring in Windsor Forest, | ib. |
| Medical Graduations at Edinburgh, | 438 |
| Surgical Examinations at Edinburgh, | 439 |

NOTICES TO CORRESPONDENTS.

Communications have been received from Dr FURLONGE, Mr DAVID MASON, and an Anonymous Correspondent, on the use of Nitrate of Silver in Burns.

The following Works have come to hand :—

American Medical Biography: or Memoirs of Eminent Physicians who have flourished in America. To which is prefixed a succinct History of Medical Science in the United States from the first settlement in the Country. By James Thacher, M. D. &c. &c. &c. Two volumes in One. Boston, 1828. 8vo.

Illustrations of the Atmospheric Origin of Epidemic Diseases, and of its relation to their predisponent constitutional causes, exemplified by Historical Notices and Cases, and on the twofold means of Prevention, Mitigation, and Cure, and of the powerful influence of change of air, as a principal remedy. To which are appended, Popular Rules for the Maintenance of Health. By T. Forster, M. B., F. L. S., M. A. S., &c. &c. &c. 2d Edition. Chelmsford, 1829. 8vo. Pp. 216.

A Review of the Doctrine of a Vital Principle, as maintained by some writers on Physiology. With Observations of the Causes of Physical and Animal Life. By J. C. Pritchard, M. D., F. R. S., &c. &c. &c. London, 1829. 8vo. Pp. 236.

Appendix to the Second Edition of a series of Observations on Strictures, &c. &c. By R. A. Stafford. 1830. Pp. 52.

A Treatise on Pulmonary Consumption; its Prevention and Remedy. By John Murray, F. S. A., &c. &c. &c. London, 1830. 8vo. Pp. 156.

A Treatise on the Mineral Waters of Harrogate and its Vicinity. By Adam Hunter, M. D., &c. &c. London, 1830. 8vo. Pp. 138.

The Edinburgh New Dispensatory: containing, 1. The Elements of Pharmacy. 2. The Materia Medica; or the Natural, Chemical, and Medical History, of the substances employed in Medicine. 3. The Pharmaceutical Preparations and Compositions; including Translations of the Dublin Pharmacopœia of 1826, London Pharmacopœia of 1825, and of the Edinburgh Pharmacopœia of 1817. With Illustrative Commentaries and Tables. Twelfth Edition, much enlarged and improved. By Andrew Duncan, M. D., Professor of Materia Medica in the University of Edinburgh. Edinburgh, 1830. 8vo. Pp. 1127.

A Short Tract on the Formation of Tumours, and the peculiarities that are met with in the structure of those that have become Cancerous; with their Mode of Treatment. By Sir Everard Home, Bart. &c. &c. &c. London, 1830. 8vo. Pp. 98.

Remarks on the Disease called Hydrophobia, Prophylactic and Curative. By John Murray, &c. &c. &c. London, 1830. 8vo. Pp. 86.

NOTICES TO CORRESPONDENTS.

On the Anatomical Peculiarities of the Sturgeon, (*Acipenser Sturio*, Lin.) By David Craigie, M. D. Edinburgh, 1830. Pp. 40. [From the Wernerian Transactions, Vol. vi.]

Beiträge zu den Rückgrathskrankheiten. Von J. Hinterberger, k. k. Professor, in Linz in Oesterreich ob der Enns.

Physikalisch-medicinische Darstellung der bekannten Heilquellen der vorzüglichsten Länder Europa's. Von E. Osann, Professor der Medicin zu Berlin. Erster Theil. Berlin, 1829. 8vo. Pp. 461.

Lehrbuch der pathologischen Anatomie des Menschen und der Thiere. Von Dr Adolph Wilhelm Otto, &c. &c. &c. Erster Band. Berlin, 1830. 8vo. Pp. 472.

Von der Lage der Organe in der Brusthöhle als Einladungs-Programm zu der an der hiesigen Königlichen medicinisch-chirurgischen Lehranstalt, den 7th September 1829. Vormittags um 10 Uhr im anatomischen Hörsaal stattfindenden öffentlichen Prüfung. Von Dr A. W. Otto, Königlichem Medicinal-Rathe und Professor, &c. &c. Breslau, 4to. pp. 35.

The Medico-Chirurgical Review, and Journal of Practical Medicine. Edited by James Johnson, M. D., &c. No. 25, July 1830.

The London Medical and Surgical Journal; including the London Medical Repository, exhibiting a view of the Improvements in the various branches of Medical Science. Nos. 25, 26, and 27, July, August, and September. Edited by Michael Ryan, M. D. &c. London, 1830.

The London Medical Gazette, from June 12 to September 4. No. 144.

The North American Medical and Surgical Journal. Published under the auspices of the Kappa Lambda Association of the United States. Nos. 17 and 18, January and April, 1830. Philadelphia.

Engravings of the Arteries of the Human Body from Tiedemann. By E. Mitchell. No. 15, 16, 17, 18, 19.

THE
EDINBURGH
MEDICAL AND SURGICAL JOURNAL.

1. OCTOBER 1830.

PART I.

ORIGINAL COMMUNICATIONS.

ART. I.—*Fifth Quarterly Report of the Edinburgh Surgical Hospital from 8th April to 8th August 1830.* By JAMES SYME, Esq. Fellow of the Royal College of Surgeons London and Edinburgh, and Lecturer on Surgery in Edinburgh

IN commencing this Report, I have great pleasure in stating that the College of Surgeons of Edinburgh now recognize, not only the Clinical Lectures, but also the attendance of the Surgical Hospital, as qualifications for their diploma.

I may take this opportunity of explaining the sources from which were derived the L. 800 that appeared in last Report as paid by me to the support of the institution.

| | |
|--|--------|
| Fees of Students attending my Clinical Lectures, | L. 400 |
| Board of two House Surgeons for six months, and one do. for twelve months, | 200 |
| Surplus of expenditure required from myself, | 200 |
| | <hr/> |
| | L. 800 |

Since last Report, 545 cases of surgical disease have been presented for relief. Of these 82 have been admitted into the house.

Excision of Elbow-Joint.—John Malloch, æt. 30, from Perth, a missionary of the Baptist persuasion, entered the Hospital on the 23d of June on account of a diseased elbow-joint, of which the following account appears in the Journal.

" His left elbow is very much enlarged, œdematous, and inflamed. There are two sinuses communicating with the joint; one situated immediately over the olecranon, and the other about three inches lower down. There is little pain, except on pressure, when it is very acute. He cannot allow of any motion of the joint, keeps his fingers extended, and seems to be afraid of moving the arm in the slightest degree.

" Seven years ago, he fell upon his left elbow and bruised it; two months afterwards it swelled and suppurated, and continued to discharge through several successive openings for two years. It then healed up, but remained swelled and stiff. Last January he was attacked with severe pain in the joint, which increased till five weeks ago, when matter formed, and was discharged by one of the former openings. A fortnight afterwards, another abscess collected over the olecranon, and was opened by a surgeon in Perth.

" 25th, Mr Syme proceeded to cut out the elbow-joint. Running his knife into the joint, with its back to the ulnar nerve, he made a transverse incision across the arm, close to the olecranon, as far as the external condyle. From the middle of this incision another was made down the arm over the ulna about three inches in length, and from the extremities of the one first mentioned there were made two up the arm about two inches long. The flaps being dissected back, the articulating extremities of the ulna, humerus, and radius were removed. The diseased synovial membrane was cut out, and the edges of the wound were then brought together by stitches. Two arteries spouted, but did not seem to require ligatures. The limb was placed in a bent posture enveloped with caddis and a long bandage, to give it support. In this case Mr Syme deviated from his usual practice, by making a longitudinal incision downwards from the centre of the transverse one, instead of two at its extremities, since he thus included the sinuses in the line of incision, and more readily exposed the ulna, which was the bone principally diseased.

" Cloths wet with cold water were applied after the operation to check the disposition to bleed; but about two o'clock, as there was still a good deal of hemorrhage, Mr Syme removed the dressings, and found it to proceed from an artery in the integuments of one of the lower flaps. The bleeding vessel being tied, the dressings were then replaced.

" 26th, The wound is looking very well, and seems as if it would heal by the first intention. Pulse quick. Cold lotion to be continued. Tartrate of antimony, with Epsom salts, to be taken every hour.

" 28th, There is a good deal of constitutional irritation.

He complains of oppression over the stomach, and a little difficulty of breathing. The wound has not healed.

" 29th, A copious foetid discharge from the elbow, with some redness and tension.

" 30th, Feels much better; swelling subsiding. Acetate of lead lotion, with bandage, to be continued.

" July 1st, Appetite much better. To sit up in bed.

" 2d, He was out of bed most of the day.

" 3d, The redness and swelling are quite gone. The edges of the wound to be brought together with adhesive plaster, and sulphate of zinc wash to be applied with bandage.

" 5th, The elbow is looking well, and the wound is granulating kindly. To have steak and a pint of porter.

" 9th, He had rigors yesterday. Elbow appears to be doing very well.

" 15th, The cross incision has almost healed, but the longitudinal one is kept open by the ulna being bare at its extremity, which threatens to exfoliate. A large abscess has formed on his right hip.

" 16th, The abscess was opened and a poultice applied.

" 19th, He has had frequent shivering and sweating fits; pulse quick and weak. To have wine instead of porter. Mr Syme laid open the sinus in the hip, the discharge from which was profuse. Dry caddis and bandage applied. The elbow is improving, the discharge is not nearly so great; and a distinct groove can be felt on the ulna between the dead and living bone.

" 20th, He thinks himself stronger; the rigors are not so frequent. To have sulphate of quinine, a grain and a-half three times a-day, and a glass of port wine every three hours.

" 24th, He had rigors twice yesterday afternoon. About two o'clock this morning, when at stool, there was considerable hemorrhage from the hip. He is weaker than yesterday, and complains of great pain in his right groin, which is a little swelled.

" 25th, He is no better, pain in the groin is still much complained of.

" 26th, His pulse is much weaker, the pain in the groin is excessive; obscure fluctuation can be felt on the iliac side of the vessels.

" 27th, He complains of embarrassment in his breathing, with pain of chest. Pulse 160.

" 29th, He has been slightly delirious; other symptoms as before; he is much weaker.

" 30th, Cold cloths applied to his forehead at his own desire. Pulse can hardly be felt.

" 31st, He died."

On dissection the abscess of the hip was found to extend upwards among the muscles as high as the lumbar region. There was an extensive abscess between the ilium and iliacus internus descending into the groin. There were old adhesions between the pleura pulmonalis and costalis on both sides, but especially on the right. Upon the centre of the anterior surface of the left lung lymph had been recently effused to a considerable extent, and about eight ounces of sero-purulent turbid fluid lay in the pleura of the same side. The lungs in several parts were indurated or hepatized, and in some places suppuration had taken place so as to form deposits of the size of a walnut. On the surface of the brain the vessels were more turgid than usual, and in some places there were small ecchymoses. Great part of the wound was healed, but the extremities of both the humerus and ulna were exfoliating.

This unfortunate man, whose thin emaciated care-worn appearance indicated an age not less than fifty, though it really was no more than thirty, was certainly, as the result showed, a most unfavourable subject for operation. At the same time this is the only one of ten cases of excision of the elbow-joint which has terminated fatally; and I sincerely believe, that any operation, however slight, which had the effect of at all disturbing the constitution, would have given rise to equally disastrous consequences. This extreme tendency to disordered action could of course be learned only when it was too late.

David Forret, æt 28, from Cupar-Fife, recommended by Dr Scott of Cupar, on account of a diseased elbow-joint, of which he gave the following account: "Nine months ago he began to be troubled with a gnawing pain at the back of his right elbow, as if between the ulna and humerus. There was then no swelling; the motion of the joint was somewhat impeded, but did not increase the pain. In January, he observed a small tumour, about the size of a bean, a little above the internal condyle, which broke two weeks afterwards, and has continued to discharge ever since. Up to this time he had not been incapacitated from working, the pain which he felt being only moderate, and ascribed to rheumatism. But four months ago, without sustaining any injury, the joint inflamed, becoming red, swelled, and excessively painful, so as to render the slightest motion intolerable. He was blooded and leeches repeatedly, by which means the activity of the disease was subdued, and shortly afterwards, another opening made its appearance on the outside of the olecranon. The constant discharge, gnawing pain, stiffness of the joint, and general exhaustion consequent on this severe and protracted disease, have

made him extremely anxious to obtain relief, and willing to submit to any measures necessary to afford it. He is thin, pale, and evidently much reduced by his sufferings."

This case evidently required either excision or amputation. My friend Mr Webster, Surgeon of the 4th Dragoon Guards, who saw the patient on his admission, and who had not at that time witnessed the operation of excision, declared that he would have no hesitation in amputating the arm. Though there was evidently very extensive disease of all the soft parts, I did not consider this any objection to excision, and, accordingly, performed the operation in the usual manner, that is, by making a transverse incision from the ulnar nerve to the external tuberosity of the humerus, close to the olecranon, and then one upwards and downwards at both of its extremities. All the bones entering into the articulation were very much diseased, the cartilage being abraded and the surface carious. The synovial membrane, being very much thickened and gelatinous, was cut away as far as possible, one small artery of the integuments was tied, and the edges of the transverse incision were stitched together; but the extreme softness of the diseased integuments rendered it impossible to close the longitudinal ones in this way, as the threads instantly cut their way out. Caddis and a bandage were then applied.

The patient has done extremely well; the swelling of the joint is now almost gone; the discharge is almost entirely ceased; and he has the prospect of being soon dismissed cured.

Elizabeth Johnston, æt. 16, from Falkirk. In the first of these Reports, I mentioned the case of this girl, who entered the Hospital last summer on account of a diseased elbow-joint, which exhibited the most formidable appearance of any that I have yet met with, but which, nevertheless, was completely cured by the operation of excision. She returned home, and remained perfectly well, using the arm for all ordinary purposes until December last, when, after exerting herself too much, her wrist swelled and became painful. Tartar emetic ointment was applied, and afterwards blisters; but an abscess soon formed, which opened, and has continued to discharge ever since. A probe introduced into the sinus, which is situated over the lower end of the radius, enters a large carious cavity of the bone, and can be pushed downwards into the wrist-joint.

As amputation appeared the only resource, it was performed on the 24th June above the elbow, by the method of double flap. She recovered most favourably, and is now well.

The elbow being dissected, afforded a specimen of the union which is established between the bones in such cases. When the integuments and muscles were dissected off, the appearance

presented was wonderfully little different from that of a natural joint, owing to a great mass of fibrous ligamentous-looking substance which connected the bones together. This connecting medium, which was above an inch in length, and perfectly flexible, did not constitute any thing analogous to an ordinary articulation, and more resembled the structure that usually exists in the false joints that result from fracture of the bones. My friend and pupil, Mr Charles Bell, made a sketch of the preparation, which gives a very good idea of its appearance, and which, therefore, I have caused to be engraved to illustrate this description.

The unfortunate occurrence of disease in the wrist after that of the elbow had been removed, certainly affords no objection to the operation of excision. In one of these Reports I mentioned the case of an old woman, whose hand I removed on account of caries of the wrist, and who afterwards required amputation of the arm, for disease of the elbow-joint. No one, I suppose, would consider that case any objection to the operation of amputation.—In the last number of this Journal, Dr Christison has stated, that, from what I have seen of excision of the knee-joint, I am not inclined to practise or recommend it any more than M. Rotix, who also thought it right to satisfy himself as to the advantages of the operation in regard to this joint by actual trial. But in the diseases of the shoulder and elbow-joints requiring removal there cannot be a doubt that the introduction of excision instead of amputation is a very great improvement. Most of the patients on whom I have operated now use their arms for all the purposes, and with the same facility, as formerly. It has seemed surprising, that in the course of eighteen months I should have had occasion to perform the excision of ten elbow-joints. To account for this it will be sufficient to recapitulate the places from which the patients came.

| | | | | | |
|-----------|---|---------------|---|-------|----|
| Edinburgh | 3 | Falkirk | 1 | Cupar | 1 |
| Aberdeen | 1 | Auchtermuchty | 1 | Perth | 1 |
| Lanark | 1 | Arbroath | 1 | | — |
| | | | | | 10 |

Caries of Trochanter Major.—James Lothian, æt. 40, applied on the 13th of July, on account of a sinus of the hip, which opened behind the trochanter major, and allowed a probe to enter very deep. As the complaint had existed for sixteen years, I concluded that it must be connected with diseased bone; and thinking it possible that an exfoliation of the ischium might be the root of the evil, as in the cases described in a former number of this Journal, I admitted the patient, in order to examine his case more particularly. Having found that the trochanter major was carious, I did not think it prudent to undertake any

operation, as the results of attempts to remove caries of this part, as far as I knew, had been uniformly fatal. He was dismissed on the 16th, and then entered the Royal Infirmary, where the diseased bone was extracted. He died a few days afterwards.

In proceeding to relate the following cases, I feel at considerable loss as to the title by which they ought to be designated. They are chronic affections of the joints, very much resembling each other in their causes, symptoms, and treatment, but the precise tissue in which they originate, and chiefly reside, as well as the morbid alterations of structure that attend their commencement, and precede the final state of suppuration and caries, which is the same in all, have not hitherto been satisfactorily ascertained. Rust of Berlin has employed the term *arthrocace*, or joint-evil, to express this affection, denoting the particular joint concerned, by prefixing the word designating it in the same language. Thus, he speaks of Spondil-arthrocace, or Vertebral-disease, Cox-arthrocace, or Hip-disease, Gon-arthrocace, or Knee-disease, Om-arthrocace, or Shoulder-disease, Olecran-arthrocace, or Elbow-disease. This nomenclature is generally followed by German writers, and I have used it in these Reports to express the disease in question, when affecting the shoulder; but as I have been accused of pedantry for doing so, I fear that the certainly somewhat uncouth expressions just mentioned, as applied to the corresponding affection of the knee and elbow, might give still more offence, and, therefore, will use their English equivalents.

Hip-Disease.—Jean Spowart, æt. 8, applied at the Hospital on the 8th of July. Her left leg seemed much shorter than the right one. The hip was more round and projecting than usual. She complained of great pain in the joint, particularly at night. She could not rest any weight upon it, but allowed it to be pretty freely moved. This affection was referred to a strain received in falling five months ago.

As no fluctuation could be discovered, I concluded that the disease was still in its second stage, and within reach of relief from the actual cautery. It was applied accordingly, and the patient has already derived so much benefit, that she sleeps without any disturbance from pain, and can rest the weight of her body upon the affected limb.

Knee-Disease.—Thomas Brown, æt. 20, from Larbert, Stirlingshire, entered the Hospital on the 28th of May, on account of an enlargement of the knee, which was of very considerable size, chiefly about the head of the tibia, impairing the mobility of the joint, rendering any attempts at motion excessively painful, and occasioning at night, even when kept quite still, such uneasiness as to prevent the patient from sleep-

ing. The complaint had existed twelve months, and been particularly severe during the last five.

The actual cautery was applied very freely on both sides of the knee, so as to cause a large slough of the skin, partly by its direct effect, partly by the inflammation which resulted from its operation. So soon as the suppuration was fairly established, the patient began to mend. The nocturnal pains left him, the swelling diminished, the joint became more moveable, and he could rest his weight upon it. He was dismissed on the 12th of July with every prospect of retaining a limb not certainly so sound or useful as it originally had been, but still so far recovered as to be quite sufficient for enabling him to follow an employment not requiring much active exercise.

Mrs Harvey, æt. 32, residing in Leith, was reported to the Hospital on the 11th of June, on account of a diseased knee, which it was thought would require amputation. Her friends were desired to bring her up, but next day intimated that they had found it impossible to effect her conveyance, owing to the extreme agony which was occasioned by any attempt to move her. In these circumstances, I suggested that she ought to be placed in a large clothes basket, which would render her removal equally easy and free from pain. This was accordingly done, and she entered the Hospital on the 13th of June. The following account of her case appears in the Journal:—"Her left knee is swelled to nearly twice its natural size, and exquisitely painful. The pain is constant, but increased by the slightest motion or pressure. The integuments covering the joint are not discoloured. There is great œdematous swelling of the foot and lower part of the leg. Five weeks ago she suddenly felt a violent pain in her left knee, so excruciating as to make her cry out. For some days there was no swelling, but it then appeared, and has since gradually increased. For some time she could bend the knee, but was never able to extend it without aggravating the pain. Now she cannot use the joint either for extension or flexion." On the 14th, I applied the cautery very freely to both sides of the joint. On the 16th, there was no pain except from the burn. She has since been progressively improving; the swelling has entirely disappeared both from the knee and foot; she can move it pretty freely without pain; she has been dressed and sitting up; and is about to leave the Hospital.

Elbow-Disease.—Helen Pentland, æt. 30, was admitted on the 5th of May, on account of a painful swelling of the right arm, which extended from the elbow to the hand. The pain extended generally through the limb, but was particularly severe at the elbow and wrist. The elbow was much enlarged and exces-

sively painful, especially during the night, and when subjected to pressure, or attempts to move it from the semi-bent position, in which she invariably kept it. Five weeks ago, without any assignable cause, she felt a pain in the elbow. It continued not very severe for four or five days, and seemed to be subsiding under the use of frictions. A most violent pain then all at once came on, and the joint began to swell. The symptoms rapidly increased. She had fits of excessive pain, during which the muscles near the joint were spasmodically contracted. The joint was leeches, poulticed, and bled to the extent of twelve ounces by cupping. The swelling and redness diminished, but the pain continued constant. She then applied to a surgeon, who prescribed warm fomentations, and led her to believe that amputation was the only remedy.

I applied the actual cautery on both sides of the olecranon, so as to make two long eschars. She improved progressively. The following report appears for the 29th. "A very great improvement has taken place. The arm is now of the natural shape and size; she has no pain even on pressure; but there is still little motion of the joint." She was dismissed on the 15th of June, with no complaint except imperfect mobility, to correct which, she was advised to use warm bathing, frictions, and frequent gentle exercise.

William Bruce, æt. 25, from Brechin, recommended by Mr Laing. The right elbow is swelled chiefly at the back part of each side of the olecranon; he has no voluntary power of moving the joint, and when motion is effected by other means, it is painful and very limited. He complains of deep and constant pain, which is particularly distressing at night. The pain is not confined to the elbow, but extends through the limb, and is particularly severe at the wrist.

"Five years ago, the elbow swelled and became painful without any assignable cause. These complaints were mitigated by blistering, &c. but continued so severe as to require his dismissal from the army, in which he served in the 75th Regiment. The joint continued swelled and subject to occasional attacks of pain until three months ago, when the symptoms attained the intensity and constancy above stated."

I applied the cautery on the 2d of July. For eight or ten days he did not admit that any benefit had been experienced, but then began to perceive a sensible alteration in the appearance of the limb, as well as in the uneasy sensations proceeding from it. The swelling is now nearly gone, and the pain much diminished; but he still complains of tenderness about the head of the radius, where there is also a degree of fulness that makes me apprehensive as to the issue of the case.

As the cautery which is best calculated for effecting counter-irritation differs from that employed to arrest hemorrhage and destroy morbid structures, the only uses to which it has hitherto been applied in this country, I have thought it right to give a representation of the instrument recommended by Rust, which may be readily constructed by any ordinary blacksmith.

Thickening of the Synovial Membrane of the Knee-joint.—

John Campbell, æt. 15, Blair Athole, recommended by Dr Stewart, entered the Hospital on the 28th of May, on account of a soft elastic swelling of the right knee, chiefly over the condyles of the femur and on each side of the patella. It is not painful on pressure, or motion of the joint, but he is unable to rest the weight of his body upon the limb. The complaint commenced about three months ago, after a slight injury of the joint, which he sustained by striking his knee on the side of his bed. It has been poulticed, leeches, and blistered.

I directed the knee to be blistered on both sides, afterwards to be enveloped with the following ointment spread on caddis.

R. Hydriod. Potassæ. ʒiij. Ungt. Hydrarg. c. Camph. ʒj. Avungicæ. ʒiij.—M.

and then to be carefully bandaged. This dressing was changed once a-week, and was soon attended with decided improvement; the swelling disappeared, the mobility of the joint was restored, and he could walk without pain. He was dismissed on the 2d of July, with instructions to keep the knee bandaged, and to protect it as much as possible against all irritation.

Dropsy of the Knee-Joint.—Angus M'Pherson, æt. 16, was admitted on the 22d of June. There is enlargement of both knee-joints, with distinct fluctuation, the patellæ are felt floating, no pain, motion unimpaired.

Two months ago, without any assignable cause, he felt a stiffness of the joints; they then began to swell; he never had any pain or redness on the surface.

The joints were blistered on both sides, which speedily dispersed the fluid. He suffered a relapse from going out to walk too soon, but being subjected to the same treatment, was dismissed cured on the 15th of July.

This case forms a remarkable contrast to one treated in the house some time previously, in which the effusion was attended with excessive pain, and tenderness on motion or pressure. I lately attended a case where the pain was so distressing as to deprive the patient entirely of rest, and led to serious apprehensions for the safety of the joint. It recovered perfectly, however, under repeated bleedings and blisters.

Janet Burns, æt. 26, from Lanark, was admitted on the 23d of June, on account of a flat fluctuating tumour, about the size

of the palm of the hand, on the inner side of her right knee between the patella and condyle of the femur. It had existed for several years, and was increasing. It gave her no particular uneasiness, except apprehension as to its consequences.

Regarding this swelling as of the nature of ganglion, I made a small puncture, and evacuated a quantity of dark-coloured serous fluid. So soon as the wound was healed, I applied a blister, and afterwards made her use frictions with the iodine and camphorated mercurial ointment. As this treatment did not prevent the re-accumulation of fluid, or seem sufficient after a fair trial to produce its absorption, I made an incision about an inch long, and discharged not only a fluid similar to that formerly withdrawn, but also a quantity of soft yellow flakes, which seemed to be the remains of coagulable lymph effused at some former period. A slight degree of irritation followed, to control which she used an acetate of lead poultice. The discharge from the opening gradually diminished, and she was dismissed on the 3d of August.

This patient was one of the first cases in which I cut out the elbow-joint, and was a very unpromising one, as may be seen from the account I have given of it in the first of these Reports. The cure is nevertheless so complete, that she can use the arm (the right one) for sewing or knitting the whole day long, and when she was adjusting her dress, or arranging the applications to her knee, it was difficult for a stranger to decide which arm had been the subject of operation. I have repeatedly seen mistakes committed in doing so.

I may here remark, that a girl who came from Auchtermuchty, to have a small encysted tumour removed from her cheek, stated, that her brother, James Page, who had his elbow-joint removed last spring, (see Quarterly Report for February 1830,) now uses both arms equally; thus, for going to the well for water he carries a pitcher in each hand, and that when he requires only one hand, he uses the arm operated upon, as it is the right one. *

* I sent a request by this patient to Dr Taylor to write me particularly as to the boy's state, and received the following account. I may remark that the imperfect mobility of the limb was owing to the patient's obstinacy in neglecting to exercise it during the cure.—“*Auchtermuchty*, 28th July 1830.—DEAR SIR,—I am happy to be able to state respecting the boy James Page, on whose elbow you operated in the Surgical Hospital last winter, that his general health is quite good—that his elbow is free from pain, and about the same thickness as the other—that, though the wound cicatrized very slowly, it is now, and has been for some time, perfectly whole,—that his use of the *hand* seems to be not in the least impaired; and, accordingly he employs it (being his right hand) for ordinary purposes which do not require much motion of the elbow-joint,—that he seems to have the same strength in the arm operated on as in the other, for when he has any thing of considerable weight to carry,—for instance, as much water as he can bring in a pitcher, he does it with his right arm,—and that, though, as you must be aware from the state in which he left the Hospital,

Caries of Ankle-Joint.—William Whitelaw, æt. 19, from Cuppar Angus, recommended by Dr Rogers, was admitted on the 21st of May. The left ankle is much swelled, red, and painful. On the outer side there is a distinct fluctuation. There are two openings over each malleolus, through which a probe passes readily into the joint, where the surface of the bones is bare and rough. The leg of the same side is much emaciated. His appearance indicates great and continued suffering.

Ten weeks ago, when leaping a ditch, he strained his foot. When he came home it swelled, and was very painful: the swelling never subsided. He has had two blisters applied without any advantage.

The abscess over the external ankle opened the day after his admission, and afforded him a little temporary ease; but he still suffered from pain and profuse discharge; and it was evident that it had come to be a question between the loss of his limb and his life.

I amputated the leg on the 31st of May by single flap, and nothing occurred during the cure that seems worthy of notice, except the extreme weakness of the patient, who continued decidedly hectic for several weeks after the operation. He is now restored to health, and proposes soon to return home.

In performing amputation for disease of the foot, it is usually thought proper to amputate at no greater distance from the knee than is sufficient to afford the patient a convenient support for the body, unless he can afford the expence of procuring an artificial limb. It appears to me, however, in all cases desirable to preserve if possible the use of the knee-joint, by retaining a half of the leg, which is quite sufficient for the purpose, since a common wooden leg can be as easily fitted to this stump as to one higher up; and it is needless to add, that the patient can walk, sit, and perform all other ordinary motions much more easily when he possesses the use of the knee-joint than when he does not. George Robertson, whose case is mentioned in the Third Report, came to the Hospital yesterday, at my request, to show how well he could walk with the assistance of a wooden leg, adapted to a stump of this sort. It was constructed by his father, one of Mr Trotter's workmen.

The girl Anne Stewart, I may take this opportunity of men-

he has but a very limited motion at the elbow, yet he has a little. He usually puts on and takes off his bonnet, and can also use a spoon with his right hand, but for the latter purpose he generally prefers the left. On the whole, he is certainly in a vastly better situation than if he had lost his arm. I believe every one who sees him readily acknowledges that. I have only farther to join with his parents and friends in expressing my hearty gratitude to you for the service you have so kindly rendered him. It is due also to all concerned to say, that though he must have some not very agreeable recollections and associations, he always speaks with delight of his stay in the Hospital. Wishing, &c. I am, Dear Sir, yours truly, J. TAYLOR."

tioning, who had the amputation through the tarsus performed last summer, continues perfectly well, and walks so that no one would suspect that she had suffered any mutilation.

Margaret Hay, æt. 26, was admitted on the 8th of June. Has great cedematous swelling of the left foot and leg. There are small openings over the great and little toe, another over the front of the ankle-joint, and a fourth over the malleolus externus. Through the two last-mentioned a probe may be passed to the bone at the outer ankle.

She has for several years back been affected with occasional attacks of erysipelas in the left leg, which generally lasted for two or three days, leaving some swelling of the limb. Nine months ago abscesses began to form, of which the sinuses that have been mentioned are the remains. Her health is much reduced, and she is very desirous of being relieved.

I amputated the leg on the 13th. The wound healed very well, but the patient regained strength slowly, and was not dismissed till the 20th of July. She still continues in a weak and unsatisfactory state.

Amputation at Shoulder-Joint.—John Williamson, æt. 26, fish-monger's servant, applied at the Hospital in the summer of 1829, on account of an ulcer upon the middle of the right deltoid muscle. It had a very foul malignant appearance, and allowed the probe to pass in various directions to the bone, which, however, could not be felt either bare or rough. He was admitted into the Hospital some time afterwards, as a deep-seated suppuration had pointed near the coracoid process, and it was thought that the bones must be affected. The matter was discharged, and the original sore was freely touched with caustic potash, after which it was dressed with black wash, and healed so nearly that he was dismissed in a state that enabled him to resume his employment. Early this spring he applied again on account of a deep-seated abscess at the elbow, which was opened, and allowed the probe to pass into the substance of the external tuberosity of the humerus. The old sinuses at the shoulder had also become more painful and copious in their discharge. He was re-admitted on the 18th of May, and all means were employed to cure his complaints without having recourse to the summary, but unsatisfactory process of amputation at the shoulder-joint. As all these proved unavailing, I performed this operation on the 2d of July, by making two semilunar incisions, commencing at the acromion process, and meeting below at the inferior margin of the axilla. Sir George Ballingall completely controlled the hemorrhage, by pressing upon the subclavian artery above the clavicle. The axillary artery and two smaller vessels were tied, after which the edges of the

wound were stitched together. The patient made no particular complaint after the operation. On the 12th day he requested permission to visit his friends at home, and on the 20th he was dismissed.

On account of the state of the soft parts I preferred the method of operating above described to that of Lisfranc, which is certainly much quicker and easier both for the patient and surgeon.

Osteo-Sarcoma of Tibia.—Magnus Linkater, æt. 23, from Wick, Caithness, recommended by Mr Henderson of Wick, entered the Hospital on the 29th of May, on account of a tumour of the right leg. The tumour commenced immediately below the knee, and seemed to engage the tibia, which, at this part, felt more than twice as thick as usual. It caused a projection on the outer side of the limb between the tibia and fibula; it could be felt ascending into the popliteal space, and descended under the calf of the leg, so as to stretch the gastrocnemii muscles. The consistence of the tumour was unequal, generally soft, and in some places conveying the feeling of fluctuation, but in others as hard and unyielding as if composed of cartilage.

He stated that nine months previously to the time of admission, after being much exposed to cold and wet in the course of his employment as a cooper, he observed a small swelling about two inches below the tuberosity of the tibia; it was at first not painful, but shortly afterwards became so, and his sufferings have been increasing progressively ever since. He is a tall stout-looking young man, of a sanguine complexion.

As the swelling evidently depended upon a morbid growth of the bone, I saw no remedy but amputation, and performed the operation by double flap on the 3d of June. He was dismissed on the 17th of July, having remained longer than it was necessary, waiting for a vessel to convey him home.

The limb, when dissected, presented a most beautiful and characteristic specimen of the true medullary sarcoma originating from the medulla of the tibia, passing through a round aperture in its posterior wall, and then expanding itself in all directions so as to occasion the tumour which appeared externally. It is preserved in the Museum attached to the Hospital, in which I may observe, all the preparations that have been mentioned are preserved, and may be seen by any gentleman who feels interested in them.

Fractures.—Of these 18 cases have occurred, viz.

| | | | | | |
|---------|---|----------|---|-----------|----|
| Ilium | 2 | Fibula | 1 | Ossa nasi | 1 |
| Femur | 1 | Clavicle | 3 | Ribs | 2 |
| Patella | 2 | Humerus | 2 | | — |
| Tibia | 3 | Ulna | 1 | | 18 |

Both the fractures of the ilium occurred within a few days of each other, in men about the same age, viz. between 50 and 60, were situated near the crest; were caused by direct violence, viz. the one by the kick of a horse, and the other by a fall on the side; and were treated by the same means, viz. the application of a spica bandage, under which they soon got well.

The fractured femur, which was associated with a fractured patella, happened to Nancy Baker, æt. 28, who fell from a window in Leith three stories high. There was no separation between the fragments of the patella. The fracture of the femur was treated by means of the long splint, with the facility and success uniformly experienced from this simple apparatus.

The three cases of fractured tibia derive interest from the great number, viz. 10, already treated in the Surgical Hospital, in which this bone was broken alone.

Dislocations.—Of these the most interesting was that of John Meiklejohn, æt. 18, who applied at the Hospital on the 11th of June on account of an injury of the elbow, which he had sustained the preceding evening from falling off the new Rotunda on the Mound, in the construction of which he was employed. The limb was much swelled, discoloured, and painful; it did not admit of extension, but allowed pretty free flexion without any catch or crepitation. There was a hollow below the external condyle, where the radius usually lies, and the head of this bone could be felt rolling between the internal condyle and coronoid process of the ulna when the hand was rotated.

Though there was not here the symptom which is usually considered the most constant and characteristic of dislocation of the radius forwards, viz. impeded flexion, with a sudden catch in attempting to perform it, owing to the head of the radius striking against the humerus, it was evident that this dislocation existed, and I therefore proceeded to reduce it, by causing the hand to be extended while I pressed on the displaced head of the bone, and thus readily returned it to its proper situation.

Whitlow.—Of the very great number of whitlows which came under treatment and were cured by free incision, I think it unnecessary to mention any but that of Francis Wylie, æt. 3, who applied on the 3d of July for a very severe whitlow of the middle finger, as I do not recollect of ever meeting with the disease at so early a period of life.

Extirpation of Testicle.—William Lee, æt. 35, from Leith, was admitted on the 5th of June. The left testicle is enlarged and very hard; the integuments adhere to it, and there are three openings on the front of the scrotum, which afford a thin

discharge, and allow a probe to pass into the substance of the testicle; the chord and vessels, though somewhat enlarged, appear to be sound. The right testicle is also a little enlarged; there is some fluid in its tunica vaginalis; and there is a circumscribed hydrocele of the chord about the size of a small egg.

Two years ago both his testicles were swelled for four weeks. The swelling went away of itself, but returned nine months afterwards in both testicles, without pain or redness. They continued in this state till a month ago, when the left testicle inflamed and opened. A few days afterwards two other openings formed.

Having examined the urethra, and ascertained that there was no stricture or other source of irritation connected with it to account for the disease, I dilated the sinuses by converting the three openings into one, and applied a wash. The appearance of the sore became worse and worse, and it was now evident that the gland had suffered such disorganization as to render its extirpation a matter of no regret to the patient. I performed the operation on the 15th, and found that the small portion of testicle remaining was converted into a structure resembling that of cystic sarcoma.

During the operation we had an opportunity of seeing the two hydroceles of the other side, in the chord and tunica vaginalis. The wound healed very satisfactorily, the remaining testicle contracted to its natural size, and the hydroceles gradually disappeared. He was dismissed cured on the 6th of July.

Hydrocele and Enlargement of Testicle.—"Francis Halliday, æt. 23, was admitted on the 29th June, on account of a large pyriform swelling of the left side of the scrotum. There is a distinct fluctuation felt in it. The left testicle is much enlarged and painful when pressed. He also complains of shooting pains in the small of his back.

"Eighteen months ago he received a kick from a horse on the scrotum. It swelled very much after the accident, but fell very nearly to its natural size on the application of sugar of lead lotion. In consequence of riding much on horseback the swelling returned, and became much larger than before; and he was dismissed on this account from the 72d Regiment last April. In May he entered the Royal Infirmary of this place, where some fluid was twice drawn off from the scrotum, but he left it about the end of the same month, as his complaint seemed to be getting no better. The fluid collected again, and he now felt the left testicle painful.

"2d, Mr Syme drew off several ounces of clear fluid. The testicle can now be felt more distinctly enlarged.

“ 3d, A blister to be applied to the scrotum.

“ 4th, Blister removed. The swelling is now nearly as great as it was before it was punctured. Simple dressing applied.

“ 6th, The swelling is not so great to-day, and the pain in his back is better. The blistered surface is suppurating. Acetate of lead wash to be applied to it.

“ 8th, The testicle is not nearly so large, but is still a little painful on pressure. His general appearance is much altered for the better.

“ 15th, He has now no pain. The testicle is still enlarged, and there is a little fluid in the tunica vaginalis.

“ 18th, The testicle is not nearly so large as last report, and the fluid is almost gone.

“ 23d, There is still a little fluid in the tunica vaginalis. The testicle is nearly of its natural size. To be dismissed and return in a week, when, if the fluid has again collected, it may be drawn off and wine injected.”

Hydrocele of the Chord.—Finlay Thomson, æt. 58, from Falkland, whose case is mentioned in the last Report, returned on the 1st of June with the swelling nearly as large as ever. I drew off the fluid, and injected wine with an equal proportion of water, which on this occasion was allowed to remain for fully seven minutes. A proper degree of inflammation followed. Swelling ensued, which gradually subsided, and he was dismissed cured on the 21st of June.

Wound of Penis.—Quentin Goodlet, æt. 6, admitted 18th June. Yesterday morning, while playing on the Earthen Mound, he fell over a chain, and in some way or other suffered a wound of the penis, dividing the skin completely round and round about half way between the pubes and glans. The cut edges were nearly an inch distant from each other, and the preputial part of the integuments was drawn together over the point of the penis. The edges of the wound having been brought into contact by means of a number of stitches, cloths wet with cold water were applied.

19th, There is a good deal of inflammation round the wound. Acetate of lead wash to be used.

20th, The skin, which was drawn forwards, is beginning to slough. Hot dressing to be substituted.

22d, The slough has separated, leaving an ulcer on the dorsum penis somewhat larger than a shilling.

24th, Ulcer contracting, but the prepuce is very œdematous. To be punctured.

July 3d, The ulcer is healing under the use of sulphate of zinc wash, but the prepuce is still œdematous, though it has been frequently punctured and carefully banded.

15th, Œdema nearly gone, wound almost healed. To be discharged.

Fistula of Prepuce.—Alexander Campbell applied in April, for an abscess of the prepuce, which had opened naturally by a very small aperture midway between the orifice and neck of the glans. Finding that there was a large cavity between the two layers of the prepuce, I laid it freely open with a bistoury, and then discovered that there was also a very small opening through the internal membrane near its reflexion on the penis. Different metallic washes were applied, and the sore was so much improved that he resumed his employment as a leather-dresser. He returned on the 30th of May, to show that the sinus still continued open and troublesome by the pain and discharge proceeding from it. In these circumstances, I thought it right to divide the prepuce from its orifice backwards to the internal opening which still existed. The healing process then went on favourably, and he was dismissed on the 11th of June.

Fistula in Perinæo.—In last Report I mentioned the case of Samuel Pringle, who had laboured long under the complicated sufferings of stricture with fistula, and at the time of his admission, made nearly all his water through the perinæum. When he left the house a few drops of urine still passed through the fistula, since then he has become quite well, and now declares that he feels better in all respects than he has done for twenty years. It is still thought right, however, to pass a bougie occasionally once a month or so, to prevent relapse, of which there is always more or less chance in such complaints. Indeed, this very man had once before been reported as cured.

William Gibb, æt. 50, recommended by Mr James White, admitted on the 27th July. In the perinæum, on the right side of the raphe, there is much hardness and swelling. There are two openings at this part, by which almost all the urine escapes. The prepuce is drawn back and greatly swelled, especially at its lower part, where there is much induration, and an opening communicating with the urethra. There are three very tight strictures,—one at the neck of the glans, a second between three and four inches from the orifice, and a third, the tightest of the whole, at the bulb. The left testicle is somewhat enlarged and is as hard as bone. He has frequent desire to make water, suffers great pain when doing so, and is greatly exhausted by his sufferings.

Twenty-two years ago, when in the West Indies, he had a running, for which he used a very strong injection, the consequence of which was a very violent inflammation of the urethra throughout its whole extent, and also of the testicles. Ever since, he has suffered from the symptoms of stricture. For the

last two years he has had incontinence of urine, which frequently came away drop by drop. Six months ago the two openings in the perineum appeared, and the urine took its course through them. Seven weeks since, he applied to a practitioner, who introduced a catheter, and allowed it to remain for three days, upon which a violent inflammation ensued, matter formed in the prepuce, and the anterior fistula opened.

Strictures are often attributed to the use of injections, but I believe unjustly. There appears more reason to suppose that they generally result from neglected gleet. This man, however, seems to owe his complaint to such a source;—indeed, his case considerably resembles one that I have heard of, where a gentleman, for whom an injection had been prescribed, by some mistake injected into his inflamed urethra, instead of the weak metallic washes generally employed for the purpose, a fluid preparation of cantharides used for blistering horses. The consequences after the first violence of the symptoms had subsided, were thickening, induration, and contraction of the whole canal. I have in my possession an œsophagus given to me by my friend, Mr Dewar of Dunfermline, which is greatly thickened, hardened, and contracted almost to obliteration from end to end, owing to a solution of carbonate of potass, which was swallowed hastily instead of whisky. The case is related in a former number of this Journal.

Lithotomy.—The following case, which lately occurred in my private practice, seems deserving of notice as being very unusual in several respects. A few weeks ago, Dr T. Thomson asked me to see a boy ten years of age, the son of an artist in town. He had been complaining for five years of the usual symptoms of stone, which latterly confined him to the house in the greatest misery. He had been passing small irregular fragments of calcareous matter.

On attempting to introduce a sound proportioned to the usual size of the urethra at his age, I met with an obstruction about three inches from the orifice, which required a good deal of pressure to admit the entrance of a small instrument. I felt a calculus lying in the neck of the bladder, or rather anterior to it. And putting my finger into the rectum, ascertained that this was really its situation. I performed the operation next day in the ordinary way, and extracted a mass of calculous matter the size of a walnut, which seemed to have originally consisted of two nearly equal concretions; one of these was entire, and presented a smooth flattened surface to the other, the external shell of which was broken into fragments similar to those voided previously to the operation. I then

examined the bladder by a sound, and ascertained that it contained no other calculus.

Every thing went on favourably until the urine ceased to flow through the wound, which happened about the end of a fortnight, when he began to complain very nearly as much as before. I concluded that the stricture must now be the cause of his sufferings, and proceeded to cure it by the ordinary process of dilatation. I am now able to pass number 4, and he is free from complaint. I never saw or heard of a stricture in the urethra in so early a period of life, and I rather suspect it was not a consequence of the irritation of the calculus, but the original disease, since his uneasy feelings were distinctly dated by his friends to an inflammatory affection of the penis, which occurred when he was five years of age.

Fistula in Ano.—David Watt, æt. 34, a Leith porter, of a full and athletic frame, applied at the Hospital in spring on account of a flat deep-seated chronic abscess of the right hip. It was laid freely open, and, being anxious to return home, he was dismissed as soon as it presented a healing surface, with instructions to apply a wash, and show himself from time to time. He omitted to do this, and did not return until May, when it appeared that all the cavity of the abscess was healed except a small sinus, which ran up along side of the gut, with which, however, it did not communicate. He was admitted on the 30th, and dismissed on the 12th of June nearly quite well, after the septum between the sinus and the gut had been divided in the ordinary way. He has since called to report himself perfectly sound.

James Trainer, æt. 38, from Leith, recommended by Dr Kirk, was admitted on the 25th of June. On the left side of the anus there is an induration of the integuments and subjacent parts, in the centre of which there is an opening which discharges matter. A probe introduced at this aperture passes up a winding sinus, which opens into the gut about an inch from the verge of the anus, at a different part of the circumference. He complains of pain, which prevents him from sitting, and which is particularly distressing when he goes to stool.

Two months ago, he experienced a difficulty in evacuating the rectum, and felt as if there was a lump on the left side of the gut, which occasioned great pain when it was subjected to pressure. Poultices were applied for a fortnight; matter was discharged into the gut, and the pain abated. A few days afterwards, he felt an external swelling, which was poulticed and opened by Dr Kirk, who, recognizing the nature of the case, advised him to repair to the Hospital, where he could have more attention paid to him than at home.

I divided the septum on the 26th, and he was dismissed cured on the 10th of July.

John Burnett, æt. 51, was admitted on the 18th of July on account of a fistula in ano of eight weeks standing. On the 20th, the septum between the sinus and gut was divided, several sinuses undermining the skin round the anus laid open, and the wounds dressed with caddis. For some time after the operation there was a copious thin discharge from the wound; this is now diminishing, and the wound is healing under the application of sulphate of zinc wash.

Helen Cheselden, æt. 24, wife of a soldier of the 4th dragoon guards, recommended by Mr Webster, surgeon of the regiment, was admitted on the 26th July, for a fistula in ano of four years standing. I found the external opening at a considerable distance from the verge of the anus, and the internal aperture much higher up than usual, fully two inches and a-half, so that the thickness of the parts requiring to be divided was very considerable, and rendered it impossible to bring out the point of the bistoury at the anus previous to the division, which almost always can be done, and renders the operation much easier both for the patient and surgeon. It happened that the same day on which I cut this fistula, I was asked by Dr Fife, of Northumberland Street, to operate on a patient of his, a respectable person, about thirty, where the internal opening was still higher up, and the thickness of parts of course still greater. Such exceptions, however, are certainly rare, and the important fact observed by M. Ribes, (see First Report) that the internal opening is seldom more than an inch distant from the verge of the anus, ought to be carefully recollected in the treatment of this disease, together with the no less valuable observation of Foubert and Sabatier, that an internal opening almost always exists.

Ulcer of the Lip.—About a fortnight ago I was requested to visit a poor woman at Cannonmills, who was said to labour under an incurable cancer of the face. I found the patient lying in bed; she was a married woman, about 36 years of age, and a most miserable object. She was extremely emaciated, and her countenance exhibited that greenish yellow hue which is usually associated with the worst kinds of malignant disease. Her lower lip and neighbouring part of the right cheek was ulcerated, greatly swelled, and red, much of the lip had been destroyed, and the remaining surface was sloughing, and afforded a copious intolerably foetid discharge. She had had frequent profuse hemorrhage; the glands under the jaw were much enlarged.

“ Eight months ago a wart formed on her under lip, to remove

which she used different applications, which, however, only irritated it and made it worse. Three months ago it was about the size of a sixpence, when she applied to a surgeon, who applied caustic daily, till it growing larger he proposed to excise it, when she left him."

I advised her to be taken to the Hospital, that we might examine her case more accurately, and determine if any thing could be done.

She was admitted on the 15th of July, and had an acetate of lead wash applied to the ulcerated parts; the effect of this application was very remarkable. Next day the foul discharge almost ceased, the sloughs had separated, the swelling had fallen, and the inflammation was much abated. This amendment continued to increase, and it seemed as if the ulcer would have cicatrized without any further interference; but I thought it right to cut away a portion of the lip which, from the destruction of the neighbouring parts, projected forwards and hung down. She was dismissed at her own desire on the 24th of July, to attend her family. On examining the portion removed, I found traces of the scirrhus structure, and therefore, notwithstanding the favourable promise of the case, felt apprehensive as to its result; and she accordingly returned on the 4th of August, desirous of having the remainder of the ulcer removed. It now presented the characteristic features of cancer, and I did not hesitate to cut it all away.

Helen M'Queen, æt. 70, from Lasswade, recommended by Mr William Wood, was admitted on the 22d of July, on account of a cancer, which occupied a half of the upper lip and two-thirds of the lower one, together with a large portion of the cheek. It had a firm consistence, and presented an irregular tuberculated surface, with cauliflower-looking excrescences.

As the disease, though extensive, was quite detached, I thought it right to comply with the wishes of herself and friends for its removal, and performed the operation on the 24th of July. I brought the wound together as far as possible, and united the skin to the mucous membrane of what remained. The patient was of weak intellect, and excessively obstinate, so as to be quite unmanageable, and, by constantly persisting in speaking, strained and irritated the parts so as to oppose their union, and delay their subsequent healing by granulation. Nevertheless, the cure went on, on the whole, favourably so far as concerned the local disease; but large purple marks appeared on the skin of both arms, and afforded a bad indication as to the state of her constitution. On the 1st of August, when the wound was just about healed, and I thought of sending her home, she suddenly suffered a smart attack of erysipelas of the face, from which

she recovered under the free use of spirits and water given internally.

Inguinal Abscess.—Mrs P. from Orkney, aged 49, was admitted on the 20th of June, on account of a large tumour in the left groin, fully equal to a child's head, and another in the iliac region of the same side, of a still greater size. It was difficult to ascertain the extent and connexions of the latter swelling through the parietes of the abdomen; but it evidently contained a fluid which fluctuated distinctly both in it and the external tumour when pressure was applied. She complained of great uneasiness in the course of the anterior crural nerve. As there was no reason to suspect disease of the vertebræ or hip-joint, I introduced a trocar into the external part of the abscess, and drew off *five pounds* of pus. The wound healed by the first intention, and the patient felt so much relieved, that she insisted upon going home a few days afterwards, and would not wait until the cure could be completed, by taking away the matter which remained, or had re-accumulated.

ART. II.—*Observations to endeavour to ascertain if Dead Animal Matter absorbs Air on exposure to the atmosphere;—and if the Putrefaction of Animal Matter is attended with an elevation of Temperature.* By JOHN DAVY, M.D. F. R. S. Physician to the Forces, and Corresponding Member of the Medico-Chirurgical Society of Edinburgh.—(Read before the Medico-Chirurgical Society of Edinburgh, December 2, 1829.)

IN a paper which was sent to the Medico-Chirurgical Society in March 1828, “on the effect of removing atmospheric pressure from the solids and fluids of the human body,” I have cursorily admitted, that air is absorbed by the body after death on exposure to the atmosphere:—And, in another paper sent to the Society last February, “on the temperature of the human body after death, &c.” I have called in question the evolution of any sensible heat during the decomposition of animal matter by putrefaction.

Reflecting since on both these subjects, and consulting such authors as were within my reach, who have in any way treated of them, the data on which I reasoned on the occasions alluded to have appeared to me imperfect, and the conclusions unsatisfactory. This has been a sufficient inducement to me to make a set of experiments on each question, the result of which I have now the honour of communicating.

I.—*Is air absorbed by Dead Animal Matter when it is exposed to the atmosphere?*

1st, *Of the Blood.*—It is commonly believed that blood readily absorbs oxygen from atmospheric air. I have thought it right to commence the investigation with endeavouring to determine if this is true. The experiments which I have made for the purpose have been of two kinds;—one, by agitation for a short time of blood in air;—the other, by exposure of blood to air over mercury for a longer time. The blood used has been venous blood, principally from soldiers who required blood-letting on account of slight ailments, and whose blood had very much the character of blood in health. For the first set of experiments the blood was allowed to become cool, (sometimes excluded from the air, sometimes exposed to the air,) and it commonly became cool in about three hours. Then the crassamentum which had formed was broken up, the fibrin was as much divided as possible, and the whole was intimately mixed. Sometimes I used only a very small quantity of this, as about a drachm, and agitated it in three or four cubic inches of air in a glass tube under water, that there might be no change of temperature. Sometimes I employed as much as a pound, agitating it in a large quantity of air in a flask of two or three gallons capacity, provided with an empty bladder and stop-cock. The agitation of the blood in the confined air was continued from eight to fifteen minutes. The room in which the experiments were made was favourable to accuracy of result,—the temperature of it being very equable, seldom varying more than a degree in the twenty-four hours, and seldom differing more than a degree from the water with which it was abundantly supplied. The temperature of the rooms, during the period of the inquiry, viz. in July and August, was at the commencement 76° ,—in the middle of the period for a short time 79° —and towards its conclusion about 77° .

In opposition to the commonly received opinion stated above, the results of these experiments were negative.—When the experiments were made in the most careful manner, the volume of air exposed to the blood was not changed, nor was its composition appreciably altered. If the experiments were not very carefully made, and great attention paid to temperature, sometimes there appeared to be an absorption of air, and sometimes a diminution of it: and if the blood was more than twelve hours drawn, the volume of air was always diminished.

Similar experiments with fresh serum, and with the colouring matter of blood, obtained from the crassamentum by pressure through a coarse linen bag, gave the same negative results,—and

that even when the colouring matter had been kept twelve hours, and the serum longer.

When I used fibrin alone, procured by pressing and washing the clot in a linen bag, (the clot being obtained from blood drawn about three hours,) the result was somewhat different. The volume of air in which the fibrin was agitated was unaltered;—but a little carbonic acid gas was formed, about 2 per cent.

In the second set of experiments, blood, and the serum, the fibrin, and the colouring matter of blood, were exposed to common air, in close vessels, over mercury. The results obtained were in accordance with the preceding, and, as it appears to me, explanatory of them.

I may mention, that the blood used was placed in a vessel over mercury a few minutes after it was drawn, having been cooled quickly by immersion in water. During the first twelve hours, the volume of air over it was not sensibly changed. Soon after there was a diminution of the bulk of the air, and this diminution gradually increased. When greatest it was nearly equal to the volume of the blood. This was accompanied by a change of form of the crassamentum;—it, as it were, dissolved away, and an apparently homogeneous fluid was formed. And next, there was an augmentation of the bulk of the air. By examination at different times I have found that the volume of air remained unchanged till putrefaction commenced;—that carbonic acid gas was formed and absorbed by the blood;—that the diminution of volume of the air continued till the blood was saturated with carbonic acid;—and that its augmentation was owing to farther evolution of this gas, connected with the formation of ammonia and the progressive changes of the putrefactive decomposition.

The air over the serum of blood remained many days without undergoing any change of volume; and so long the serum retained its transparency. At length a turbidness appeared in it, putrefaction commenced, and the volume of air diminished, owing, as I have found, to the absorption of carbonic acid gas which is formed. When the serum was saturated with carbonic acid, the putrefactive process continuing, the volume of air slowly increased.

Results very similar were obtained, with the colouring matter alone;—or (which is more correct) the mixture of serum and red particles obtained by pressing the crassamentum gently in linen. The changes in this instance were much the same as in the preceding. They took place more slowly than when blood with all its ingredients was employed, and less slowly than when the serum of blood was used.

The changes exhibited by the fibrin of the blood were the most rapid of all. In less than twelve hours it lost its firmness;

a small diminution in the volume of the air had taken place ; a little carbonic acid gas was found in the residual air, and oxygen had disappeared equal in volume to the loss by absorption, together with the acid gas generated. In twenty-four hours, or little more, the fibrin had become semifluid or pultaceous, the oxygen of the air had disappeared entirely, or nearly so, and its place was supplied by carbonic acid gas, excepting a diminution, (which it may be inferred was carbonic acid gas absorbed,) very nearly equal to the volume of the semifluid formed. As the putrefactive process proceeded, the fibrin divided into two parts,—one pultaceous, and a little frothy, occupying the spot where the fibrin was first put,—the other liquid, surrounding this pultaceous matter ;—and the volume of air gradually increased, carbonic acid gas being evolved, attended with the formation of ammonia, and the other changes belonging to advanced putrefaction.

Having given the results of these experiments, which appear to me to prove that blood does not absorb oxygen when fresh, and that when there is an apparent absorption of oxygen it is owing to the formation and absorption of carbonic acid by the alkaline blood,—I do not consider it incumbent on me to controvert farther the commonly received opinion. All the experiments are easily made ; most of them I have repeated, and more than once ; and I hope they will be repeated by others, confident as I am, that the results I have described will be obtained, if the proper precautions are used, especially those relative to the influence of temperature. It is right, at the same time, to remark, that slight variations of results may occasionally occur, as I have myself witnessed, according to the quality of the blood used, and of its different ingredients, and especially according to the quality of the serum, which, of all the parts of the blood, seems to be the most variable in its composition, and the properties thereon depending.

The theoretical bearings of the above results now require some attention.

It is generally believed that the difference of colour of venous and of arterial blood is owing to the one having been acted on by atmospheric air, and the other not. And this notion, it is supposed, has been confirmed by venous blood, on exposure to the air, acquiring the florid hue of arterial blood. Is this generally received opinion sufficiently well established on undeniable facts ? This question naturally occurred to me after finding that blood has not the power of absorbing oxygen. Then I thought it necessary to reconsider the evidence on the subject, and to make farther experiments on many doubtful points ;—and the conclusions to which the inquiry has led me are, briefly,—that the scarlet colour which venous blood acquires on exposure to the air is

not owing to any chemical change from exposure ;—and that it is very doubtful if the difference of colour between venous and arterial blood depend on the action of air.

I shall begin with noticing the facts on which I found the first conclusion.

1. Though air is excluded from venous blood the instant it is drawn, as by receiving it in fresh white of egg, milk or serum, in which it immediately sinks, nevertheless on coagulation the surface of the crassamentum will be of a comparatively light florid hue.

2. The same florid hue may often be seen on the side of the cake of crassamentum, though surrounded by serum.

3. And in the instance of blood with a buffy coat, on separating the buffy coat from the crassamentum,—the under side of the former will generally exhibit a florid hue.

4. I have never observed this hue at the bottom of the crassamentum, or in the inferior part of it in slices cut horizontally.

5. It may, however, be produced in the inferior surface by inverting the clot in serum before it is firmly coagulated.

6. But it is not produced by inverting the clot firmly coagulated in the open air, and immediately applying blotting-paper or linen with gentle pressure in all directions, to absorb rapidly the most fluid or serous part of the mass.

7. Whenever I have witnessed a very florid hue in any part of the surface of the crassamentum, then, on minute examination, I have always found a layer or stratum of variable thickness, composed chiefly of fibrin, and containing only a minute quantity of colouring matter.

These and other circumstances have induced me to believe that the florid hue acquired by venous blood on exposure to the air, is owing to a partial subsidence or separation of the colouring matter ;—and that at the surface it is more florid and lighter, simply because the colouring matter is there less concentrated,—and darker at the bottom and towards the bottom, because the comparatively heavy colouring matter is there more concentrated.

I shall notice some facts and circumstances which appear to me to support this idea. Whatever white or colourless fluid is used to dilute the colouring matter of blood, without exerting on it any well marked chemical action, renders it brighter. This effect is produced by the addition of white of egg, or milk, or distilled water deprived of air by boiling or the air-pump :—and a similar effect is produced by the diffusion of the concentrated colouring matter on any white ground, as paper, wood, &c. But the contrary effect results from whatever causes the approximation of the colouring particles. This is very remarkably exemplified during the gradual contraction of

the crassamentum : as the crassamentum contracts, and the serum is pressed out, it becomes darker ;—and the longer the blood is in coagulating, and the less viscid the coagulable lymph or fibrin,—so much the more abundant is the colouring matter at the bottom of the clot,—so much the less mixed with fibrin there,—and in the same proportion so much the darker.

In the body too, whatever tends to produce an accumulation of the red particles has the effect of darkening the blood in the veins which are sufficiently near the surface to be seen. Position has this effect in a well known manner ; how dark the veins of the hand become if long pendant ;—how light if held up and the muscles gently exercised ; and the appearance is the more striking if the hand, under the different circumstances of position, is held between the eye and a bright light. A ligature on a limb produces, in a stronger degree, the same effect as the pendant position. In the operation of phlebotomy, the blood which flows first is almost invariably the darkest ; and the longer the ligature has been previously applied, generally so much the darker is the blood. The red particles in this instance appear to descend from the minute vessels into the larger trunks, chiefly by their own momentum ; leaving, it may be conjectured, a diluted blood behind. Commonly, during a blood-letting, the more rapid the stream, so much the more florid is it ; and, not unfrequently, when flowing very freely, it becomes of the hue attributed to arterial blood.

Next, relative to the colour of arterial blood, I am led to believe, that its florid hue (such as is usually attributed to it) is exaggerated. Very many circumstances conspire to give such an exaggerated notion ; as the rapidity with which the arterial blood flows ; the smallness of the stream in the majority of instances in which it is witnessed ; its being generally more or less scattered around, over linen and the skin ; or, if collected in a vessel, it is almost always mixed with air and in a frothy state. The circumstance last mentioned is deserving of particular attention. By agitating blood deprived of its fibrin, or before the fibrin has coagulated, it assumes, as is well known, a beautiful scarlet hue ; this hue it retains so long as it is in a frothy state ; but as the froth subsides, the light hue disappears. The same phenomenon occurs in agitating the blood in hydrogen gas free from acid fumes ; and also, when colouring matter has been added to sugar and water, and a froth raised by the disengagement of carbonic acid gas, in consequence of fermentation ;—proving demonstratively, it appears to me, that the change of colours is not owing to chemical combination, but to mechanical mixture with air. In the instance last mentioned, the colour of the froth, it may be remarked, is just perceptibly

purplish, carbonic acid having the effect of imparting to blood a fine purple tint.

Moreover, in consequence of the peculiar structure of the arteries, and the force of the heart acting *à tergo*, there can be, under ordinary circumstances, no accumulation of blood in these vessels as in the veins, and still less of the heavy colouring matter of the blood. It is only in the left cavities of the heart and pulmonary veins, and occasionally in the aorta after death, and occasionally in the sac of an aneurism, that we have an opportunity of seeing blood in an accumulated quantity in the arterial system. After death, on examining the cavities and great vessels of the left side of the heart, the blood in them has always appeared to me much of the same colour as in the right; at least when there has been no material difference in point of quantity. Now, considering that this has been observed in cases of sudden and violent death, and in cases of death from very various diseases; that the temperature of the body frequently at the moment of death has not been apparently impaired; that the function of respiration has often been the last apparently performed with vigour; and that the residual air in the lungs, in many instances, as I have ascertained by experiment, has undergone the change usual in healthy respiration,—taking all these circumstances into consideration, it appears to me, that this similarity of colour of venous and arterial blood, met with after death, is not what might be expected *a priori* according to theory; and tends to prove, what I have brought it forward to prove, that the notion of the difference of hue of venous and arterial blood commonly entertained is an exaggerated one.

The only accurate way which I am aware of to ascertain the real degree of difference of colour of the two kinds of blood, is by comparing venous and arterial blood abstracted from the same animal. This comparison I have often made with the blood of the sheep, and occasionally with that of the dog and rabbit. Sometimes the blood collected from the carotid artery has not been distinguishable from that collected from the jugular vein, so that when placed beside each other, it was impossible to say which blood was venous, which arterial; one would have supposed they came from the same vessel. Sometimes there has been a barely perceptible shade of difference between the two, and occasionally a marked difference. Generally I have observed that the venous blood which flows first is darkest, and also that the arterial blood which flows first is darker than that which flows afterwards, especially the very last.

On the whole, the conclusion which I am disposed to draw is, that there is no specific difference of colour between the two

kinds of blood, and that the occasional difference witnessed may be attributed principally to the occasional preponderance in venous blood of colouring matter. In confirmation, it may be mentioned, that I have generally found arterial blood of less specific gravity than venous; and the arterial blood which flows last, when the vessels of the expiring animal are nearly emptied, and which appears most florid, as has been already stated, is also of least specific gravity. Farther, in confirmation, it may be remarked, when there is a difference of colour between venous and arterial blood, that it is most striking whilst the blood is fluid; for when coagulation takes place, and the crassamentum is contracted, and the serum expressed, the clots of the venous and arterial blood are brought to a kind of equality in relation to the degree of the colouring matter.

Two other circumstances, there is ground for conjecture, may also be concerned, when there is a difference of hue between the two kinds of blood, viz. a preponderance of saline matter in venous blood, and of chyle, or imperfectly formed and very light-coloured particles in arterial blood. Accordingly, I have generally found the serum of venous blood of greater specific gravity than that of arterial; and sometimes the difference has been as great as 1029 and 1019:—And we know that the colouring matter of the blood is darkened by most of the salts which are found in serum, especially the subcarbonated alkali and common salt. In relation to the second circumstance, I may state, that I have seen a light-coloured sediment, in appearance very like reddish chyle, separate from the crassamentum of arterial blood, having been pressed out apparently during its contraction in the same manner as the serum. The effect of this sediment when present must unquestionably have been that supposed. I have even seen the blood from the right side of the heart, in the instance of a dog well fed some hours before he was killed, and abounding in chyle, more florid than the blood in the left side; so much so, that a person ignorant of the cavities from whence the two samples had been taken, judging merely from their appearance, would have said that the venous was arterial blood, and the arterial venous.

The mere separation of carbon from venous blood in its passage through the lungs does not necessarily imply a change of colour, either darker or lighter, as will be admitted readily by the philosophical chemist. Some of the whitest bodies abound in carbon, as camphor; and the purest form of carbon itself is white, namely the diamond. A very simple experiment may be brought forward in favour of the notion that the colouring matter in venous and arterial blood is essentially the same. When a portion of the crassamentum of venous blood, and another of

arterial, is put on an inclined plane in water, a current of colouring matter dissolved by the water descends from each, and continues flowing till only fibrin remains. Each current is precisely of the same bright vermilion tint. I have carefully watched them, and I have not been able to observe the slightest difference.

It occurred to me, that though blood does not absorb oxygen at ordinary temperatures, or give rise to the formation of carbonic acid gas, it may do so under circumstances approximating to those it is exposed to in the lungs in healthy respiration. The trial which I have made with this view, though a coarse one, I shall relate. About half a pound of fresh venous blood (the crassamentum of which had been broken up) was put into a large retort, provided with a stop-cock and flaccid bladder. The bulb of the retort, containing the blood, was immersed for a few seconds in warm water at 110° Fahr. ; then it was taken out, and for a few seconds briskly agitated ; and this alternate immersion and agitation was continued for about a quarter of an hour. On cooling, the volume of the air was found unaltered, and no carbonic acid gas could be detected in it ; thus showing, in addition to the preceding facts, that blood out of the body does not afford carbonic acid gas till putrefaction has commenced ;—the dead exhibiting a striking contrast with the living change ;—the one depending on putrefaction, and connected with the generation of ammonia and the destruction of fibrin ; the other, apparently in opposition to putrefaction, and connected, there is reason to believe, with the perfecting of the formation of fibrin ;—the one pertaining to a class of facts of a purely chemical character ; the other to the phenomena of peculiar secretion, or of mysterious animal change, to guide us through the mazes of which we have at present no clue.

Whether there is any essential difference between venous and arterial blood in more important particulars than colour, I shall not here stop to consider. It would seem that there is a very remarkable one in regard to their influence on the living system ; and it may well be, though their colouring matter is the same.

2dly, Of the different Animal Textures.—I have placed in a measured volume of atmospheric air over mercury portions of different textures taken from animals just killed, as the rabbit and ox, or from the human subject, a few hours after death. Paying as much attention as possible to uniformity of temperature under the favourable circumstances already described, and watching the experiments carefully, I have never been able to observe any immediate absorption of air. In

several instances, as of muscle, liver, intestine, &c. there was no diminution, but a progressive increase of volume from evolution of air. In the few instances in which diminution of volume did take place, it was very inconsiderable; and, as this was accompanied by incipient putrefaction, and generally attended by the appearance of some carbonic acid gas, is there not good reason to infer, that it was entirely owing to the absorption of carbonic acid gas formed,—especially as the moisture of the part, or the fluid which it contained, was sufficient to account for it,—and the oxygen which disappeared was equal to the absorption added to the carbonic acid gas remaining? In corroboration of this view, I may mention the difference of results obtained when animal substances were exposed to putrefaction under increased and diminished pressure, by means of a column of mercury acting on the air in which the substances were confined, in one instance in the closed end of a tube bent upwards, in the other in the closed end of a straight tube, both of course placed perpendicularly. When the pressure has been increased by the weight of eight inches of mercury, and diminished by a counterpoise of sixteen inches, the results have been well marked, especially when using very putrescible substances, as fibrin of blood and muscular fibre. With the increased pressure, at a temperature of about 76°, fibrin being used, there has been, in twenty-four hours, a small diminution of volume of the air, with just sensible marks of putrefaction having begun; whilst with the diminished pressure there has been a small increase of volume, and a manifest appearance of putrefaction having commenced. Now, it follows of course, that the carbonic acid gas first formed would be more powerfully absorbed and retained with increased pressure than with the diminished; but, if oxygen were absorbed chemically, there is no reason to suppose that the change of pressure would produce any difference of effect except in degree.

The experiments of which I have just related partly the results, were made during the same period of time as the preceding on the blood, and at the same comparatively high temperature of atmosphere favourable to rapid putrefaction. The degree of rapidity of change varied according to the nature of the texture. Brain, muscle, spleen, liver, and the substance of the glands generally produced the most rapid change. In a few hours carbonic acid gas might be detected in the air exposed to them; and generally in less than twenty-four hours there was air generated and an increase in the volume of the air. The soft white parts were next in degree of rapidity, such as the cutis, periosteum, dura mater, and, I may add, stomach, intestinal canal, vein, artery, and adipose structure. Over these in about twenty-four hours, carbonic

acid gas could generally be detected in the air ; and generally in about forty-eight or seventy-two hours, a little air was generated. Tendon, intervertebral substance, cartilage, cuticle and bone, were slowest in progress. In two or three days, carbonic acid gas appeared in the air in which they were contained ; but many days elapsed before there was any increase of volume indicating the generation of gas, excepting the parts belonged to a young animal.

After the putrefactive process had commenced, it proceeded though the oxygen of the atmospheric air was entirely consumed ; carbonic acid gas continued to be disengaged, in which sometimes a little carburetted hydrogen might be detected, and sometimes a little sulphuretted hydrogen ; ammonia was also constantly formed ; but I have not been able to satisfy myself that any azote was either absorbed or evolved, at least in the early period. The appearance of the carburetted hydrogen was most striking in the instance of muscle : it occurred irregularly, sometimes early in the process, more frequently at a later period. One day it might be detected in the air generated, —not in the next. Softening of the parts, like a deliquescence, always marked the progress of the change, and most of them became pultaceous. After about a fortnight or three weeks, brain, muscular fibre, the parenchymatous substance of the glandular structures, and the spleen were reduced to a very soft state, and on washing them the soft matter, the result of putrefaction, was removed, and the vascular structure of the part well displayed, and in the instance of muscle, the tendinous attachments also, and the aponeuroses. And these in their turn yielded and became decomposed,—the process being allowed to continue, as I shall have a better opportunity of describing hereafter, when noticing the same changes taking place in the open air.

II.—*Is the putrefaction of Animal Matter attended with an elevation of temperature ?*

I shall give in some detail the experiments which I have made to endeavour to determine this question. It may be premised, that they were all made in the same place as the preceding,—that the subjects of them, as soon as possible, after they were taken from the body, were put into glass vessels lightly covered with and muffled in dry flax, for the purpose of diminishing the influence of the atmospheric air as a cooling medium,—and that a vessel holding water was placed contiguously, for the sake of comparison in relation to temperature. I shall commence with the blood and its different ingredients, or parts into which it may be separated out of the body, and from them proceed to the solid textures.

Blood.—On the 19th August, about a pound and a half of venous blood, taken from a young man labouring under a slight febrile ailment, moderately firmly coagulated, having been abstracted about three hours, was broken up so that the colouring matter, the fibrin, and serum were well mixed, and immediately put into a glass vessel in the manner premised for observation. On the 20th at noon its temperature did not differ from that of the water contiguous. At 6 P. M. of the same day, when the temperature of the water, was 78° , that of the blood was 80° , and its odour was peculiar and rather offensive. On the 21st, when the water was 79° , the blood was the same as the day preceding. On the 22d, when the water was 80° , the blood at the surface was 82° , and a little below the surface 81° . Its smell was offensive and ammoniacal, and its liquidity was increased. On the 23d, the temperature of the blood was the same as that of the water; and so it continued, whilst slowly undergoing decomposition.

The colouring matter of Blood.—About two pounds of the colouring matter of the blood of an ox, from which the fibrin had been separated in the usual way by agitation, but not deprived of serum, was exposed to observation on the 19th August. It was examined once or twice daily. Its temperature never rose perceptibly above that of the water. On the 22d, it had an offensive smell, and mixed with lime gave off an ammoniacal odour. In a few days the odour became more ammoniacal and less offensive, and so it continued afterwards whilst gradually undergoing the changes peculiar to its very slow decomposition.

Serum of Blood.—The observations which I have made on the putrefactive decomposition of this fluid, do not indicate any sensible evolution of temperature attending it; a result which might be expected, considering that its putrid changes take place very slowly, and that many months are required for its complete decomposition, whether the quantity of serum be large or small, and even when freely exposed to the air in a damp atmosphere.

Fibrin of Blood—On the 19th August, at four P. M. the fibrin of the whole blood of an ox was separated in the usual manner by agitation, and was immediately well washed and drawn out loosely, so that its surface might be well exposed to the air. In its moist state, as it was placed for observation, it weighed about four ounces and a quarter. On the following day, when the water was 78° , the fibrin about an inch below the surface was 85° ; its odour was peculiar but not fetid. At two P. M. the water being of the same temperature, the fibrin was 90° ; its odour was peculiar and rather offensive. At 6 P. M. the water the same; the fibrin had fallen to 87° . It had become soft, as it were melting or deliquescent, and in consequence

it had subsided so much that it occupied only about half the space it did when introduced, and of course was much less exposed to the action of the air. It was slightly alkaline, and a little of it mixed with hydrate of lime emitted a distinct ammoniacal odour. On the 21st, the water being 79°, the fibrin was only 80°. It was semifluid, of a light-brown colour, and had a peculiar, rather disagreeable smell, distinctly ammoniacal. On the 23d, its temperature and that of the water were the same; it was of a light-gray colour, so fluid as to admit of being poured out in drops, and it had a pretty strong and tolerably pure ammoniacal odour; and after this there was no sensible elevation of temperature attending the changes which slowly took place during its progressive decomposition.

These experiments on the blood and its ingredients, I may remark, are not solitary ones. They have been repeated several times, and the results have been similar, and similar generally, so far as I have observed, whether the subject was the blood of the ox or human blood.

Muscle.—On the 25th August, the heart of a man who died the same day, and of whose case I shall take brief notice in an appendix, as No. 1, was placed for observation. No change of temperature was observable till the 27th; then it was 2° higher than the water; its odour was not putrid. On the following day its temperature was the same; its odour peculiar and disagreeable, but not distinctly fetid; its surface was sprinkled with the ova of flies, and with minute maggots. On the 29th it was 3° above the water. On the 30th, at the surface it was 5° higher, whilst about an inch below its temperature was the same as that of the water. On its surface there was some froth and maggots in great abundance. The odour of the surface was peculiar and ammoniacal; of the part below the surface peculiar, but not distinctly ammoniacal. On the 31st, it was 7° above the water, when maggots abounded, and were feeding voraciously, and there was a strong ammoniacal odour. The experiment was then interrupted by excluding atmospheric air; the froth subsided; the maggots died; and the temperature of the part fell to that of the water. A similar experiment was made with the psoas muscle of the same subject, and with precisely similar results. Other experiments have been made in a somewhat different form, and results have been obtained also somewhat different. When flies have been excluded, muscle has undergone a comparatively slow change; it has gradually softened, become unctuous, acquired a peculiar odour, lost its cohesion, and has become converted into a reddish semifluid, not unlike chyme, with a very strong ammoniacal odour. In one instance this change took place between the 6th and 21st

August. The temperature was not elevated more than 2° at its maximum. When the muscular fibre has been unravelled, and an extensive surface exposed to the air, the change has been very much more rapid. The conversion of muscle into pultaceous fluid has taken place in six days, and the temperature has been elevated 7° .

Brain.—I shall give two different experiments made on this organ entire, or nearly so, deprived of its membrane, belonging to bodies No. 1 and 2. That on No. 2 was commenced on the 14th July. On the 15th its temperature and that of the water were the same, viz. 76° . On the 16th, at its surface, it had risen 3° , whilst the deeply-seated portions varied according to their depth from 2° to 1° . The surface was then soft, brownish and fetid; what was below the surface was apparently little altered. The temperature of the brain continued increasing till the 21st, when it had risen 11° ; then its surface was covered with froth; maggots of large size, and in great plenty were feeding greedily; and the odour was strongly ammoniacal. From this time the temperature gradually fell. On the 31st it was only 2° higher than the water; on the 1st August, only 1° ; and on the 4th, there was no difference. At this time its surface was grey, soft, of saponaceous appearance, free from maggots, and emitting a powerful ammoniacal odour; and even then two inches below the surface it appeared to be but little changed. The experiment with brain No. 1, was begun on the 25th July. The highest temperature attained by it was only 1° above that of the water; and on the 11th August, it was the same as that of the water. In this instance the number of maggots generated on its surface was less than in the former; their growth was less rapid; they fed with less avidity; the surface was always comparatively tranquil, and the ammoniacal odour comparatively faint; and a rancid peculiar odour, latterly, was rather predominant.

Lung.—It belonged to body No. 1, and was put into the vessel for observation divided into portions not very small. The highest temperature which it acquired was on the 30th July, then the water being 77° , its temperature at the surface, and just below the surface, varied from 78° to 90° . Where the low temperature was observable, there it was tranquil and without maggots;—where the temperature was high, there maggots abounded and were in great activity; the space they occupied was surrounded by a margin of froth; the ammoniacal odour was strong, and the portion was becoming of a dark blackish hue, and liquid. The experiment was then interrupted by the exclusion of air. On the following day, the maggots appeared dead; and the temperature had fallen to that

of the water. On the 2d August, atmospheric air was again admitted. The temperature of the whole never again exceeded that of the water perceptibly, though it did partially, as in portions where maggots were collected feeding, and where froth was produced. Thus, on the 6th August, whilst the surface in general was covered with a grayish byssus, and was only at the temperature of the water; in one spot, about an inch in diameter, it was 6° higher, and there, in the midst of froth, there was a brood of maggots rapidly growing and eagerly feeding. On the 27th August, the whole presented the appearance of an inky fluid, of the temperature of the water, and strongly ammoniacal; apparently deriving its black colour from carbonaceous matter liberated and suspended, mixed with particles of cellular tissue, and at the bottom with shreds of pleura and fragments of vessels, which became apparent on washing.

Liver.—It belonged to body No. 3, and was placed for observation on 3d August. On the 5th, its temperature was the same as that of the water; its odour was offensive, but not ammoniacal; a good deal of reddish fluid had exuded, and a little air was in the act of disengagement. On the 4th, in some places it was 1° higher, and in others 2°. Where highest, some froth was formed, and many small maggots were feeding. The temperature gradually increased till the 10th, when it was raised 12°. Its surface was covered with maggots feeding voraciously in froth, and nearly full grown, and the odour was powerfully ammoniacal. From this time it gradually decreased, till on the 13th it did not exceed that of the water; most of the maggots were dead; the odour was very ammoniacal; the surface was free from froth, and of a dark brown colour,—in some places almost black, and of soft pultaceous consistence. Beneath the surface the change decreased with the depth, and in the lower part the liver was comparatively little altered; its parenchymatous substance was softened, of a grey hue, and easily removed by gentle pressure, aided by a stream of water; whilst the vascular structure, (at least all but the very minute branches,) retained sufficient strength to resist the pressure and water, and accordingly became well displayed by the operation.

Intestines.—These were from body No. 4, and were placed for observation after having been washed out on the 3d July. Their temperature on the 4th was the same as that of the water, though the odour arising from them was offensive. On the 5th, their temperature was 2° higher; on the 6th, the same as that of the water; and so it continued, though a great deal of foetid air was disengaged, and the surface had become pultaceous, and emitted an ammoniacal odour. The stomach of No. 1. afforded results very similar. Its temperature never exceeded

that of the water more than 1° , and that only partially where a few maggots were feeding, and a little froth was excited. And in both instances, below the surface two or three inches, there was little change. After a month the parts appeared entire; but on minute examination, after having been well washed, the tissue which remained appeared to be chiefly the submucous and peritonæal. Neither the inner coat nor the muscular could be recognized, and even the white tissues were in parts losing their cohesion, and exhibited evident marks of slow decomposition being in progress.

Cutis of inside of Thigh, Dura Mater, Tendo Achillis.—These parts were taken from body No. 1, and were placed together in the same vessel for observation. They underwent change slowly; their temperature gradually rose till it was 3° above that of the water, viz. on the 31st July, when the odour from them was slightly ammoniacal, their surface unctuous, and there were a few maggots feeding. After the 2d August, the difference of temperature was 1° , and it was the same on the 16th of that month. A good deal of yellowish pul-taceous matter was formed, by which the parts were hid. It was washed off, and the different textures were found nearly equally changed; their cohesion irregularly diminished; the fine connecting tissue or most delicate fibre dissolved entirely or in part; holes formed in the two first mentioned textures, and the coarser fibres or fasciculi of fibres separated in the last. On the 1st September, they were all reduced to an ammoniacal pul-taceous state, in which only a few minute tendinous fibres were distinguishable.

Aorta.—A portion of this vessel belonging to body No. 1, placed for observation, was 1° higher than the water on the 30th July. It had a peculiar and ammoniacal odour, and its surface was becoming unctuous, especially its compact fibrous sheath, or the third coat from the inner one. On the 11th August, there was an elevation of 3° ; a good deal of light brown pul-taceous matter had formed; the odour was strongly ammoniacal, and many maggots were feeding. On the 16th August, it was entirely converted into a semifluid, opaque mass, of a light brown colour, and strong ammoniacal odour; and its temperature and that of the water were the same.—I have also made trial of the different coats of the aorta, placed apart for observation, viz. the loose outer cellular, containing some fatty matter,—the adjoining compact cellular or rather fibrous coat, the next, commonly called the middle coat, and the inner coat taken from body No. 5. The changes in all of them proceeded much in the same manner as has been described in the preceding instance, with the exception of the loose cellular coat, which in that

instance was excluded. It did not keep progress with the rest, and after a month's exposure, it was very little changed.

Intervertebral substance.—A portion from the lumbar spine was taken from the body No. 5, on the 7th August. On the 13th it had a peculiar odour, neither putrid nor ammoniacal. After a month it was very little changed; and during that time its temperature was not sensibly elevated above that of the water. From other experiments I have ascertained, that a very long time is required for the decomposition of this substance, and that even after a year it is not very considerably changed.

Besides the preceding, I have made trial of other parts, as the pancreas, kidney, spleen, prostate. They have undergone change rapidly, like the liver; their temperature has been considerably elevated; they have all softened, as it were liquefied like fibrin, and ammonia in great quantity has been generated.

I trust, more than sufficient has been adduced to decide the question proposed,—“Whether the putrefaction of animal matter is attended with an elevation of temperature?” It seems proved, that those parts which undergo rapid change, as the fibrin of blood, brain, muscular fibre, and the parenchymatous substance of glandular structures, give off a good deal of heat in being converted from the solid into the liquid form: And, as other parts undergo a similar change, and are ultimately reduced to a liquid or pultaceous state, and as in most of them there is some elevation of temperature, may it not be fairly inferred, that the apparently inferior degree of heat generated by them is merely owing to the slowness of the change: And, accordingly, whatever accelerates the progress of decomposition, seems to promote increase of temperature. Minute mechanical division has this effect in a remarkable manner, as has been witnessed in the instance of the fibrin of the blood, and that of muscular fibre; and the effect is probably owing to the very extensive surface exposed to the action of atmospheric air. The presence of maggots, too, has the same effect very strikingly, and I believe in the same way. They tend to separate the parts, to agitate the surface, and to introduce air beneath the surface. It is curious to watch the progress of these animals in their growth, and still more so in their operations. When their food is very nutritious, the almost microscopic ova in forty-six hours are converted into large maggots. When they have nearly attained their full size, they feed with extraordinary voracity, as if aware that their lives depended upon their activity. The whole of a numerous brood, side by side, erect, with one extremity in the ammoniacal pultaceous mass, pump up nourishment, and with the other and longer extremity in the atmosphere, the

orifice of its canal dilated, seem to pump down air ; and thus, by the difference of the specific gravities of the two fluids, the perpendicular position of the larvæ is maintained ; and probably by the action of the one or the other, a compound is formed fit for assimilation, and for forming a part of the new animal, and at the same time the putrefactive process is accelerated. It appeared probable at first view, that the larvæ themselves might generate and possess a comparatively high temperature ; but, on the whole, the observations which I have made to endeavour to determine this point are not in favour of the notion. When the larvæ are distended with putrid matter, exhaling ammonia, and rapidly undergoing change, then their temperature, as might be expected, is always above that of the atmosphere ; but when they are free from putrid matter, internally and externally, although collected together in large number in a small space, as in a phial, a delicate thermometer placed in the midst of them did not rise, did not indicate the generation of any sensible degree of heat. And, in conformity with this, I find that maggots by themselves vitiate air very slowly ; indeed, I believe that their dead bodies vitiate it more rapidly than their living. The changes in the dead bodies in putrefying and becoming semifluid, accompanied by the formation of carbonic acid and ammonia, are more rapid than the changes of their living bodies, in passing from the larva through the chrysalis state to that of the imago, or in becoming as it were solid, which change seems to be accompanied chiefly by the exhalation of water and the formation of a very little carbonic acid gas. Mixture, probably, is another circumstance which favours and accelerates the putrefactive process and the evolution of heat. The two circumstances already adduced may partly act in this manner as well as by exposing greater surface to the air. In the saccharine or vinous fermentation the effect of mixture is well marked. So long as the sweet vegetable juice is retained in the tubes or cells of the plant or fruit, it resists change ; but the instant the tubes are crushed, and the cells broken down, and the different parts mixed, the fermentation, under favourable circumstances, commences. I suspect something similar to this happens with animal matter. It is known to every one that bruised meat putrefies rapidly ; an egg carefully put by, freely exposed to the atmosphere, without any covering over its shell, will remain free from putridity for months ; and in a dry atmosphere it will lose the greater proportion of the water which it contains, and on breaking it the yolk and white will be found dry and contracted. But if the yolk and white are intimately mixed by violent agitation, then, I believe, the mixture, even in the shell, will soon become putrid. Certain I am, that, when freely expos-

ed to the air, out of the shell, the yolk being merely immersed in the white, they do not putrefy, though, if the two are mixed, in a short time they undergo a change; they become highly putrid, and the temperature of the mixture rises several degrees.

What is animal putrefaction or the putrid fermentation? I am not aware that this question has yet been replied to in a satisfactory manner, or that the present state of our information is such as to admit of making the reply free from many obscurities. The little information I have collected bearing on the subject, I shall bring forward without hesitation.

Under diminished pressure, conducted in tubes over mercury, the putrid fermentation appears in some of its changes analogous to the vinous. The elements of vinous fermentation appear to be leaven, which remains unaltered,* and sugar, which undergoes change, and the helping circumstances a certain degree of dilution with water, and a certain temperature. The elements of the putrid fermentation are less distinct; what we are in the habit of considering a proximate animal principle, such as muscular fibre and fibrin of blood, being eminently putrescible. Whether the presence of oxygen is essential to the commencement of vinous fermentation, is matter of doubt. I am rather inclined to believe that it is not. But the presence of oxygen seems to be undoubtedly necessary to the commencement of the putrid, and only to its commencement, as we have seen that it goes on over mercury, after atmospheric air has been entirely excluded. The products of the vinous fermentation in the simplest form appear to be very few. Alcohol seems to be the only liquid product; and carbonic acid gas is the only gaseous product which I have been able to detect. The disengagement of azote I do not consider essential; and when it is met with, may it not be referred in the early part of the process to the atmospheric air entangled in the materials, and in the advanced part of the process to the decomposition of a little leaven? I have made very many experiments on this subject, the details of which I cannot with propriety here introduce. The products of the putrid fermentation seem to be more numerous. Carbonic acid gas is the principal gaseous one; sulphuretted hydrogen and carburetted hydrogen may be occasionally detected; azote, I believe, is not disengaged, excepting at a very advanced period, and when pro-

* The same portion of leaven may be repeatedly used. I have preserved it for nearly twelve months by pouring off the fermented fluid so soon as the leaven had subsided, and adding fresh sugar and water. How leaven acts is one of the mysteries of chemistry, and there are others of a like kind, as the action of lime in the formation of saltpetre, and of sulphuric acid in the formation of sugar from starch.

bably the products themselves are decomposing. The products not evolved in the gaseous state appear to be chiefly ammonia, kept down in confinement a while by carbonic acid and water ; and a substance or matter, in a semifluid form, which has a considerable resemblance to chyme, and which appears to be the proper food of the larvæ of many different kinds of the extensive genus *Musca*, some preferring the matter from muscle, others from tendon, &c. And this matter itself seems to undergo decomposition, and to be converted into ammonia and a substance more resembling extractive matter after it has been exposed to the air than any other with which I am acquainted, excepting one, which is obtained by the spontaneous decomposition of some kinds of vinegar to which atmospheric air is allowed access. During the decomposition of the vinegar carbonic acid is formed by the union of carbon with oxygen. The vinegar gradually loses its acidity, and at the same time a pellicle forms on its surface, and, gradually increasing, becomes a thick, strong, tough, transparent membrane ; elastic, strong, and transparent when dry, insoluble in water, and having great power of resisting change, whether acted on by heat, by acids, or alkalis. Very analogous to this is the substance alluded to, which I have witnessed on the surface of serum and fibrin, and of several solid parts in water, in experiments on their putrefaction continued from six to twelve months. The product from vinegar does not contain azote ; that from the animal fluids and textures has afforded ammonia when decomposed with lime at a red heat ; but, as I am not sure that any specimen of it which I have yet examined has been perfectly pure, I cannot be certain that this difference of composition really exists between the two.

Under ordinary atmospheric pressure and exposure to the atmosphere, the results of the putrefactive fermentation appear to be different ; the circumstances become complicated ; and the difficulty of appreciating them is vastly increased. The gases generated and absorbed in part seem to react and to exert a powerful modifying influence, both as retarding putrefaction and giving rise to combinations which have a similar tendency ; and inspissation at the surface from evaporation by forming a crust more or less impervious to the air generated beneath, as well as to the external air, has a similar effect. Carbonic acid gas is powerfully antiseptic, so are ammonia and subcarbonate of ammonia, and sulphuretted hydrogen, as I have ascertained by experiments made expressly for the purpose. Thus, blood saturated with carbonic acid gas does not putrefy so soon as when none of this acid gas is added to it. A solution of subcarbonate of ammonia in the proportion of three grains to the ounce of water, prevented the putrefaction of a portion of muscle

immersed in it about a month ; and a solution of the strength of ~~four grains to the ounce~~ of water preserved a piece of jejunum more than eight months, and I know not how much longer, and displayed the minute structure of the part in a very striking manner. Reduction of temperature is another disturbing circumstance, which tends, I believe, to give rise to new combinations, especially to the formation of adipocire, and to render the problem as to the changes that take place more complicated. Even in this view of the subject there is no want of similarity between the putrid fermentation and the vinous ; and a considerable degree of analogy might be traced very far were we to consider the particular agents which retard or prevent the two kinds of fermentation. I know not one agent or circumstance indeed, the effect of which is limited to the vinous or to the putrid fermentation. They all appear common to both. Such is the effect of corrosive sublimate, of the sulphureous acid, of tannin, of salt, vinegar, alum, spirit of wine, sugar, &c. I have in my possession the unfermented juice of grapes, kept more than twelve months unaltered, merely by the addition of a little corrosive sublimate ; a fluid which, without this addition, would have been undergoing decomposition in a few hours after being expressed ; and I have also a portion of muscle, perfectly preserved for a longer time by the same salt,—and which has now been in water exposed to the air six months without showing any tendency to change.

These circumstances, just related, prove some resemblance between the two kinds of fermentation in their general phenomena,—in the causes which promote and accelerate, and those which retard and prevent them. The leaven which excites vinous fermentation closely resembles an animal substance in composition and many of its properties, and is even analogous to fibrin. Like fibrin it is capable of undergoing the putrid fermentation, and the fibrin and muscular fibre act as leaven with sugar and water, and give rise to fermentation. Whether the fermentation thus excited is similar or not to the ordinary vinous fermentation remains to be shown. I suspect it is not similar in all its products. Carbonic acid gas is disengaged ; the muscle or fibrin is prevented from putrefying, and if tainted, is corrected ; but I am not aware that alcohol is formed. In one instance the sugar by the fermentation appeared to be converted into gum, powerfully absorbent of water, but very slightly soluble in water. It was the result of three or four days fermentation of a solution of refined sugar in water, excited by a small portion of beef. It appears, too, not improbable that a principle contained in the fibrin of blood, in muscular fibre, and in the parenchymatous substance of the very putrescible organs,

which are a modification of muscular fibre, may also act as leaven in animal compounds,—and I might mention some facts in support of the notion, were I not apprehensive of extending this paper beyond its due limits,—and the more, as I wish briefly to advert to one or two other points of considerable theoretical interest. On some future occasion I hope to be able to resume this discussion.

It is impossible to witness the change which takes place in muscular fibre, in consequence of putrefaction giving rise to a fluid very like chyme in appearance, without asking, may it not be concerned in digestion itself, according to the earliest theoretical notions on this subject?—or to witness the effect of the putrefactive process in raising the temperature, without also asking, may it not in the stomach and intestines be one of the sources of animal heat?

Meat slightly putrid, we know, is highly nutritive, and very easily digested. When meat is becoming tender by keeping, it is in an incipient state of, or proximate state to, putrefaction;—the muscular fibre is losing its cohesion, the textures generally in a very minor degree are doing the same, and carbonic acid gas is forming, as I have ascertained by experiment. Now, we know that carbonic acid gas is formed in, or disengaged from, the stomach and intestines, even when the function of digestion is apparently in its most healthy state, so that it does not seem unreasonable to consider this gas a product of digestion almost as much as of fermentation: The other gases, as sulphuretted hydrogen and carburetted hydrogen, occasionally evolved during the putrid changes, are frequently generated in the alimentary canal: And the contents of the stomach and of the whole intestines are seldom I believe destitute of ammonia. In relation to this last mentioned product of the putrid fermentation, I may mention, that whenever I have sought for it after death, either in the human stomach or in the duodenum, jejunum, or ileum, I have always found it; and I need not add, I have always found it in the large intestines, and in instances in which the *post mortem* examination was made before there were any indications of putrefaction having commenced in the solids or fluids generally, and when ammonia could not be detected either in the blood, the bile, the brain, or the muscles. The result of the examination of animals just killed, which I have made in relation to this point, has not been less conclusive. In one instance, I had a hungry lean dog fed at three different times during the twenty-four hours with fresh beef. Three hours after the last feeding he was killed: all the meat given him had disappeared, excepting the last meal, and the portions of

beef of which it consisted were little altered,—yet triturated with hydrate of lime, they gave off a distinct ammoniacal odour; so did a little whitish chyme in the pyloric extremity of the stomach; the chyme in the duodenum gave it off more strongly; a thin yellowish fluid in the ileum not less so; and the contents of the large intestines in a hardly less degree. I examined the blood, both venous and arterial, the chyle, the bile, and several of the solid parts, but none of them afforded by the test of lime the slightest trace of ammonia, not even the kidneys, though the urine abounded in ammoniacal salts, and emitted on the addition of lime a most powerful ammoniacal odour. These circumstances seem in harmony with the old hypothesis, that putrefaction is commenced in digestion.

In opposition, many facts may be stated tending to show, that digestion is a specific action, or series of actions,—that its phenomena are vital, or, in other words, peculiar, mysterious, and inexplicable, according to the present state of our knowledge. Many of the results of the experiments of Spallanzani and Stephens are of this character. Contrary to the idea of putrefaction, the contents of the stomach are generally acrid, and the acidity diminishes almost gradually from the stomach to the rectum. Ammoniacal salts do indeed exist in the stomach and intestines; but, in a healthy state, I am not aware that ammonia or the subcarbonate of ammonia has ever been detected in these organs, and consequently the principal product of putrefaction is found wanting.—Moreover, putridity seems to be corrected in the stomach, and its natural progress stopt. I shall not lay stress on meat, introduced in a putrid state into the stomach, having been taken out after a time free from taint, as it may be said that the putrid particles might have been destroyed, modified, or removed, as happens when tainted meat is placed in a saccharine fluid in a state of fermentation. I would rather adduce the fact, which I have witnessed, that muscle which has been in the stomach some time, when taken out and exposed to the atmosphere, does not putrefy more rapidly, but in a remarkable manner resists putrefaction.—The substance or matter derived from the decomposition of animal matter is indeed not unlike chyme in appearance. But of how little value is such a remark, and how little to be insisted on. Twenty different semifluids might be mentioned, to which, as far as the eye can judge, it bears as close a resemblance; and there is reason to suppose, and indeed the supposition is almost unavoidable, that chyme is variable in quality, and in some measure in appearance, according to the kind of food from which it is derived. It is more to the purpose to compare the matter resulting from putrefaction with

chyle. How great the difference of the two: the chyle is alkaline, and yet contains no sensible quantity of ammonia. There is no reason to suppose that it contains any free carbonic acid: it seems as it were a new formation. Chyle derived from the muscular fibre of the ox, in the thoracic duct of the dog, consists of a milk-like serum, coagulable by acids, and of lymph, spontaneously coagulable, resembling the fibrin of the blood in its manner of coagulating and gradually contracting, and resembling it also in its manner of undergoing the putrid decomposition on exposure to the air, by deliquescing as it were or becoming semifluid. I will not say how incompatible all this appears to be with putrefaction, but more, how inexplicable in relation to our imperfect knowledge of the chemical changes taking place amongst the elements of matter destitute of life, or beyond the influence of vital organs; and the results of secretion generally, do not appear less inexplicable or mysterious.

If putrefaction is not admitted to be concerned in digestion, the second question asked above is answered as regards putrefaction, "Whether, in the stomach and intestines, it may not be a source of animal heat?" But substituting digestion for putrefaction, an answer still may be required, and it might be advantageous to discuss the problem by reference to facts, and by the comparison of one fact with another. As, however, the inquiry is now become in a great measure foreign to my main subject, and as I wish to hasten to a conclusion, I shall follow it a very little way. The circumstance, that some carbonic acid gas is formed in the stomach and intestines (supposing that which is found is formed there,) is favourable to the idea of digestion being an auxiliary source of heat. The observations which I have made on the temperature of the stomach in animals is also in favour of the idea; I have often found it as high as that of the heart, and sometimes, though rarely, a degree higher. The conversion of a solid into a fluid, as of solid food into chyme and chyle, appears rather an objection to the notion. But I am not sure that it is a solid objection when properly considered,—there being so many remarkable exceptions of the kind,—even in instances where the change of form is infinitely greater, as the conversion of a solid into a gas, accompanied by combustion, without condensation even of the supporter of combustion, and *vice versa*, of the formation of a solid from the union of two gases without change of temperature. Neither am I aware of any remarkable change of form of an animal or vegetable substance, which is accompanied by absorption or evolution of heat. The fibrin of blood appears to coagulate without change of temperature: No heat is evolved when

serum is coagulated by an acid ; none when a strong solution of gum is coagulated by sugar of lead ; none when milk is coagulated by rennet. The influence of the various secreting organs on the animal temperature is no doubt highly deserving of inquiry and experimental investigation. If I might be allowed to draw an inference farther from the observations which I have made on the temperature of different parts of the body, I should be disposed to say, that, besides the *primæ viæ*, there is no other apparent auxiliary source of heat,—neither the brain, the temperature of which is generally low,—nor the kidneys, the fluid secreted by which appears in the bladder to be of rather lower temperature than the blood in the heart and great vessels,—nor the liver, the temperature of which I have never seen above that degree which might be expected considering its proximity to the lungs, its bulk, and the abundant manner in which it is supplied with blood.

In a former paper, already alluded to,—“on the temperature of the human body after death,”—two instances are given of an extraordinary high degree of temperature observed in bodies which had been dead a short time ; and in both of which the fibrin of the blood had disappeared as it does in putrefying, and yet the bodies exhibited none of the usual signs of the putrid change having even sensibly commenced. I then concluded, in consequence, that the unusual temperature was not owing to putrefaction or a *post mortem* effect ;—and, reflecting on all the circumstances of these cases, and on the phenomenon I have witnessed in my experiments on putrefaction, I am confirmed in that conclusion, and obliged to suppose, that it either arose from the ordinary sources of animal heat being more energetic than usual,—or from the cooling processes being comparatively inefficient,—or else to imagine some peculiar morbid change in the blood itself, on which, in common with the disappearance of the fibrin, the unusual temperature might have depended.

In all the instances recorded in this paper, in which, during putrefaction, there was a considerable elevation of temperature, it was at a particular period of the process,—namely, when it was most active,—when the greatest apparent change occurred, before the oxygen of the atmospheric air had disappeared,—and when the change was attended with the formation of carbonic acid gas, partly, at least, by the union of the oxygen of the air, with the carbon of the putrefying matter. Whether any heat was produced during the after part the process, when the changes took place more slowly, when oxygen was excluded, and carbonic acid gas was formed from its elements in the compound, in the same manner as ammonia was formed, may be matter of question. The results,

themselves were far from conclusive; rather hostile than favourable to the idea of heat being thus generated. The analogy of vinous fermentation, in which there is a manifest elevation of temperature, produced by the arrangement of the elements in new combinations, independent of the presence of oxygen, may be adduced in support of the notion. Were the proportion of carbonic acid gas generated in the two kinds of fermentation similar, then the analogy would be strong;—but in the putrid fermentation, the quantity of carbonic acid gas formed, independent of the oxygen of atmospheric air, is small, and the quantity of ammonia large. If the formation of ammonia, like that of carbonic acid gas, is usually attended with increase of temperature, then there would be reason to suppose, that the fermenting process of animal matter is a heating one. But I know no proof, that heat is evolved in the union of the elements to form ammonia. In relation to heat, it may be remarked, that azote and ammonia, and the combinations of the latter, and most of the former, are peculiar and anomalous. Elastic fluids are formed by the sudden decomposition of solid bodies, (the detonating compounds,) with little change of temperature. Ammoniacal gas unites respectively with the carbonic, muriatic and fluoboracic acid gases, forming solid salts without any change of temperature; and, as during the slow decomposition of ammonia by electricity, there is no evidence of change of temperature, so equally there is want of evidence of the same in its formation. The probability, therefore, is, that its elements unite without evolution, or generation of heat, and, consequently, in the putrid fermentation it cannot be considered as a cause of heat.

APPENDIX ;—containing a brief notice of the fatal Cases referred to.

No. 1. Body much emaciated, of a man *æt.* 42, who died on 25th July, of abscess of liver. The dissection was made ten hours after death. Excepting the liver, the lower part of the ileum, and the upper part of colon, the parts generally were sound. The portions of intestines alluded to were slightly ulcerated.

2. Body very little emaciated, of a man *æt.* 26, who died on the 14th July, of acute dysentery. The dissection was performed six hours after death; all the organs were tolerably sound, excepting the large intestines, which exhibited the worst effects of the disease mentioned.

3. Body not much emaciated, of a man *æt.* 23, who died on 2d August, of acute dysentery. The dissection was nineteen

hours after death ; the pericardium adhered to the heart ; there was an abscess in the liver contiguous to the gall-bladder ; the inner surface of the gall-bladder was very red, and it contained a serous fluid ; the inner coat of the colon was severely ulcerated ; the other organs were tolerably sound.

4. Body rather emaciated ; lower extremities œdematous, of a man æt. 35, who died on 3d July, of disease of heart and brain. The dissection was ten and a-half hours after death ; both sides of the heart were very much thickened and enlarged ; the central parts of the brain were very much softened ; the other organs, with slight exceptions, were tolerably sound.

5. Body rather emaciated, of a man æt. 26, who died on 7th August, of acute dysentery. The dissection was six hours after death ; no lesion was discovered worthy of notice, excepting in the large intestines, which were very extensively ulcerated, &c.

Malta, September 13th 1829.

ART. III.—*Observations on the Actions of the Heart.* By WILLIAM STOKES, M. D., Corresponding Member of the Medico-Chirurgical Society of Berlin, Physician to the Meath Hospital, and County of Dublin Infirmary. And JOHN HART, M. R. S. A. Member of the Royal College of Surgeons in Ireland, Surgeon to the Dublin General Dispensary.

NOTWITHSTANDING the great light which the labours of Laennec in his investigation of the diseases of the chest has thrown on the functions of respiration and circulation, we have long been impressed with the opinion, that his conclusions with respect to the action of the heart, so opposite to those of the most eminent physiologists, required further explanation.

Laennec maintains that the impulse of the heart felt at the præcordial region, is synchronous with the pulse at the extremities, concurring in this respect in the views of Haller, confirmed, as they appear to be, by the experiments of Bichat, and the opinions of all subsequent physiologists.

Mr Hunter taught that the pulse at the wrist was produced by the systole of the heart, in other words, that the diastole of the artery was produced by the systole of the left ventricle. It is strange, however, that this eminent physiologist did not perceive the difficulty that arose, from considering the impulse of the heart, as, compared with that of the arteries, two similar phenomena occurring, according to him, under opposite circumstances.

We had long observed that the impulse of the heart was not exactly synchronous with the pulse in the extremities, but that in almost every case it preceded the pulse by a perceptible interval of time. These observations, and the discrepancy of opinion amongst authorities of such high repute, led us during August 1829 to institute some experiments on living animals. These were performed unbiassed in favour of any particular opinion.

August 20th, 1829.—A middling sized rabbit was selected, and the pulsation of the heart examined by the stethoscope. The impulse could be plainly felt under the left scapula. The stethoscope enabled us to hear 180 double strokes, the sounds bearing a great analogy to those of the foetal heart.

The heart was then displayed by cutting through the ribs on the left side and turning back the sternum. At this period the left lung collapsed. The impulse was then observed to occur during the diastole of the ventricles and systole of the auricles. The right pleura was now perforated, when the right lung collapsed. The blood in the vessels of the heart was immediately observed to become black; convulsions supervened; and the animal appeared dead. Soon after this the ventricles ceased to act; but the action of the auricles continued, giving to the ventricle a passive motion answering to the auricular systole. The auricles continued to contract, and the ventricles occasionally, during which the longitudinal axis of the heart was evidently shortened. The sinuses of the *venæ cavæ* were observed to contract immediately before the auricular appendices, which, towards the close of the experiment, were the only portions of the auricles apparently possessed of the power of contraction.*

Experiment 2.—A rabbit of the same size as in the former experiment was taken, and the heart exposed in the same manner, care being, however, taken not to wound the cavity of the right pleura. The heart acted vigorously during twenty minutes, and the diaphragm continued in motion. The rhythm of the heart was,—first the systole of the auricle, instantly followed, and indeed almost accompanied by the diastole of the ventricle. The ventricular systole then took place, and this was followed by an apparent interval of rest, during which the auricle filled.

On taking the ventricles into the fingers, the impulse *appeared* to be given during the systole, which took place from all points, but most remarkably from the sides. This appearance of impulse during the systole was deceptive, and produced by the increased feeling of solidity during the contraction of the ventricle. On placing the tip of the finger immediately before

* See Barry's Observations.

the apex, this portion of the heart was seen to recede evidently during the systole, and again strike the finger during the diastole. This was much more evident as the action of the heart became slower.

Experiment 3.—Anxious to witness these phenomena in a larger animal, we selected a goat. In this experiment we met with some difficulty in exposing the heart from the ossification of the cartilages of the ribs. Before the heart was displayed, the animal was nearly dead from hemorrhage, two large vessels having been divided, (*mammary arteries*). The same phenomena were observed as to the impulse, it being felt during the diastole; the auricular contraction was first, then the ventricular, and then the apparent interval of rest. During the systole of the ventricles, they were observed to contract in every direction, principally from the sides. The apex also retired from the finger fully to the distance of two or three lines during the systole; but this retraction appeared subsequent to that of the sides.* In a short time two auricular contractions took place for one ventricular, and the action soon ceased.

Experiment 4.—The heart of a healthy dog was displayed. During the operation the animal lost but little blood.

The same phenomena as to rhythm and impulse were again observed. The heart was excised, and divided transversely, so as to display the open mouths of both ventricles at about one inch and a-half from the apex, the auricles and superior position of the ventricles being completely removed. We could observe a distinct dilatation of the ventricular cavities occurring about every six seconds.

These experiments obviously led us to conclude that Laennec was mistaken in his opinions respecting the impulse of the heart. It is not, as he states, produced during the systole, but during the diastole of the ventricle. In point of fact, the pulse in the extremities and the impulse of the heart, arise from one and the same cause,—in the artery from its diastole, and in the ventricular portion of the heart from the same cause. This explains satisfactorily the want of coincidence, which we have before alluded to, between the impulse of the heart and the pulse at the wrist.

We next directed our attention to this subject, and made a great number of observations. The following are the results at which we have arrived :

* The ventricular contraction obviously begins from the sides of the cavity, and it is possible that the apex of the heart applied to the parietes of the chest forms a *point d'appui*. The impulse, however, was in all our experiments plainly given during the diastole.

1st, That in a state of health the impulse of the heart precedes that of the arteries.

2d, That the interval between the impulse of the heart and the pulse in the arteries is in the direct ratio of the distance of the vessels from the centre of the circulation. Thus the interval between the impulse of the heart and that of the *arteria innominata* is often so slight as to be scarcely perceptible; the pulse of the carotid presents a longer interval, and so on with the rest.

3d, The pulsations of arteries in different parts of the body, but at equal distances from the heart, are synchronous. Thus between the pulsations of the femoral and the radial artery, as felt at the wrist, no difference could be observed.

4th, The greater the distance the longer will be the interval; thus the pulsations of the radial artery always precede those of the tibial.

5th, That, although the actual pulsations depend on the systole of the left ventricle, yet the diastole of the vessels does not occur synchronously in all parts of the body, but is progressive.

All these observations are most easily made on a healthy adult subject, whose heart is acting slowly, but at the same time strongly.

With respect to the production of the sounds of the heart, as audible by the stethoscope, it is obvious, that, for the production of such, two causes must be supposed to apply.

If, as we have endeavoured to show, Laennec's first sound, or that coinciding with the impulse, be produced during the diastole of the ventricle, it must be produced by this cause and the contraction of the auricle. To the production of the second, on the other hand, attributed by him to the contraction of the auricles, *the contraction of the ventricle and the dilatation of the auricle appear necessary.*

It is also plain, admitting an active power of dilatation in the ventricle, that the impulse of the heart is owing to a double cause, the systole of the auricle and the active dilatation of the ventricle. That the systole of the auricles assists in the impulse, is proved in our first experiment, when, after the action of the ventricles had ceased, the contraction of the auricles continued to give to the ventricles a passive motion answering to their diastole.

The application of these principles to the diagnosis of diseases of the heart is easy. We have seen no case where Laennec's diagnostics, with respect to active or passive aneurism, were mistaken, but have often failed in localizing the diseases of the valves. A *bruit de soufflet*, or *bruit de râpe*, preceding or

accompanying the impulse, must, according to our views, indicate disease in the auriculo-ventricular valves; and when it follows the impulse, it indicates disease in the aortic valves or those of the pulmonary artery.

There is an interesting case at present under our observation, in which a strong pulsation is evident in the external jugulars. These pulsations are exactly synchronous with the impulse of the heart, which is precisely what should be anticipated, considering the impulse as synchronous with the contraction of the auricles.

The experiments on which these conclusions were founded were performed by us in August 1829, in the presence of a number of pupils; and in our lectures during the last medical session we took occasion to detail them in the fullest manner. [*See End of Original Communications.*]

ART. IV.—*Notes upon the Medical Topography and Diseases of a district of the County of Donegal.* By HENRY MAUNSELL, Licentiate of the Royal College of Surgeons in Ireland, and Medical Superintendant of the Letterkenny Dispensary.

THE district of the Letterkenny Dispensary, of the medical localities of which it is proposed to give a brief sketch in the following paper, comprises the three parishes of Aughanun-chen, Conwall, and Leek, being an area of twelve or fourteen miles long, by about seven broad. The Dispensary is in Letterkenny, a town containing about* three thousand inhabitants, situated near the head of Lough Swilly. The town is built upon the declivity of a hill, in one long irregular street, running nearly E. and W., and, as most of the houses have direct access to the open country, the habits of the lower classes differ less from those of the peasantry than is usual in towns of the same amount of population. Consequently there is nothing peculiar in the diseases of the towns-people that is not observable generally throughout the district.

The face of the country presents a succession of abrupt, rocky hills, generally arranged into sharp, serrated ridges, the highest of which, Benswilly, is 1126 feet above the level of the sea. The summits and sides of these eminences are covered with bog, producing a very short species of heath, and usually interspersed with masses of primitive rock. Almost every spot bears the marks of having been formerly covered with timber. Roots of

* According to the Census of 1821, it contained 2458 persons.

fir and oak of a very large size are constantly dug from the bogs ; and in many places that are protected from the encroachments of cattle, vestiges of the ancient forests are traceable in the luxuriant coppice springing up among the rocks. Cultivation has been for some years gradually extending up the hills, and has in a few places reached to the height of 600 feet above low water mark. Amongst the heights there are numerous lesser hollows and glens, which are generally cultivated and inhabited ; but the most remarkable vallies are those containing the beds of the three principal rivers, viz. the Swilly, the Lennon, and the Glashagh. The first runs through the whole length of the district, in a direction nearly east and west. The valley of the Lennon has a course almost parallel to the former, while that of the Glashagh passes between the two in a north-easterly direction. They are all of alluvial formation, containing masses of rock, and occasionally covered with a layer of wet bog. The two first are also frequently inundated by the overflowing of their respective rivers ; and, along one side of the parish of Aughanunchen, for the distance of about three miles, a belt of mud from an eighth to half a mile in breadth is uncovered by each ebb of the tide of Lough Swilly. In addition to the three rivers already mentioned, the country is every where plentifully watered by small brooks and springs. There are a few marshes of six or eight acres each ; and besides Lough Swilly, which is an arm of the sea, there are twelve lakes, the largest (Lough Dale,) containing fifty acres, and the rest from three to eight acres each. No mineral springs have been observed, but the bottoms of wells and streams are in many places tinged with red, owing to the decomposition of iron pyrites, with which the rocks abound. A very considerable proportion (at least one-third,) of the three parishes is composed of turf bog, which varies in depth from a few inches to nine or ten feet. The substratum in the higher places is usually primitive rock, and in the vallies alluvial depositions. Agriculture, which is rapidly increasing, is chiefly confined to the growth of oats, potatoes, and barley,—the weather of the latter part of the harvest season being seldom sufficiently fine or steady for the ripening of wheat. It has not been in my power to procure any correct thermometrical or barometrical registers. I can therefore only state generally, that the climate is subject to a good deal of sudden vicissitude as to heat and cold, but within a moderate range of the scale. This temperateness may be accounted for by the vicinity of the ocean, which is received into so many bays and loughs, that there is scarcely a part of the whole county ten miles from the flow of the tide. The same reason, conjoined with the number and abruptness of the mountain ridges, is assignable in explanation of the great quantity of rain that falls throughout the year. I have

been favoured with several returns of the weather, and state of the winds, kept in different parts of the district, on the working days of the nine months from August 1829 until May 1830. By all of these it appears, that more or less rain or snow fell during half the number of days. The winds prevailed nearly equally from all points except the east. The greatest number of days upon which it blew from that quarter marked in any of the journals is only eight.

I would now wish to make a few remarks upon the habits of the peasantry, so far as these may appear to be connected with the origin or extension of disease. The people almost universally associate together in irregular villages, or, as they call them, *towns*, containing from ten to twenty or thirty family dwellings. These latter, usually built of dug stones, have one, or at most two, small apartments, in which the whole family, male and female, youthful and adult, reside, and most commonly occupy the same bed. From the badness of the thatch, and the accumulation of manure heaps, and pools of stagnant water permitted close to the doors, the houses must necessarily be extremely damp, although, from the abundance of turf, they are in most places well supplied with fuel; and certainly no complaint can be made of a want of ventilation. The diet of the people is almost exclusively vegetable, consisting chiefly of potatoes, with, occasionally, oatmeal and milk. Owing, however, to the prevalence of illicit distillation, whisky is used in considerable quantities, and not unfrequently resorted to as a medicine, especially in acute diseases. The peasantry are warmly and well clad,—indeed better than is usual in other parts of Ireland; but they are exceedingly deficient in cleanliness, both personally and in their houses. The men are employed in agriculture, and sometimes weaving; and the women in spinning, and the lighter labours of the fields. According to the census of 1821, the population of the three parishes and town amounted to 16,865. It must now, however, be much greater.

Having premised this much, I shall now attempt a review of the most important forms of disease to be found on the books of the Dispensary, pointing out the numerical proportion of each in relation to the whole number treated, and occasionally remarking on any peculiar circumstances that may have appeared in their symptoms, indications, or results. For the former purpose I have taken 3600 cases, which have been carefully noted in succession by my predecessor Dr Read, now of Coleraine, and myself. This number ought to afford a fair average of every complaint known in the district. The arrangements adopted is not founded upon any nosological system, but merely

employed as being convenient for the very brief practical observations intended to be made. I shall begin with

FEVER.

The number of fevers on the list is 487, being about 13 per cent. During the two years that I have been in charge of the Dispensary, nothing like an epidemic has occurred. The disease commencing in some individual was generally communicated to every member of his family, and sometimes to two or three other families in the village, but seldom went farther. It was usually simple continued fever; in some few instances complicated with inflammatory affections of the lungs and bowels. It was remarkable that delirium scarcely ever occurred. The treatment which appeared to succeed best was emetics, if the patient was seen sufficiently early, and afterwards purgation, blistering and small doses of calomel and ipecacuan as the symptoms indicated. Bleeding was always injurious, and when obliged to be practised on account of local inflammations, the recovery was invariably slow and protracted. Although convalescence was often tedious among the old and weak, yet the terminations were very favourable. I find, by Dr Read's report for 1823, that in fifty-three cases there was but one death; and of sixty-three cases treated by myself in 1828, there were only two fatal. Three cases of puerperal fever, and three of intermitting, are noted. The latter is never known to originate here. Two of the three which came under my own notice were contracted in England. Both soon yielded to the employment of bark.

INFLAMMATION.

No circumstance earlier attracted my attention than the mildness of inflammatory diseases among the lower classes of the district. It is observable in the rapid healing of wounds, and the slight disturbance occasioned by them to the constitution, as well as in the powerful effect produced by small bleedings upon inflammations of the various cavities, &c. There are on the list 121 abscesses of all kinds, (including mammary, paronychial, &c.) being 3.3 per cent.; 79 cases of ulcers, or 2.1 per cent.; 8 cases of gangrene, 9 of anthrax, and 21 tumours of various kinds. To the same cause, whatever it may be, which produces this feeble inflammatory diathesis, I would be disposed to attribute an extreme susceptibility to the influence of mercury, which I have constantly observed. Two or three grains of blue pill or calomel, even when followed in a few hours by a saline purgative, have produced excessive salivation.

Erysipelas is not of frequent occurrence. The number of cases is but 16, or 0.4 per cent.

Rheumatism, as might be expected from the dampness of their dwellings, is common among the peasantry. The cases on the list, including *sciatica*, are 106—2.8 per cent.

AFFECTIONS OF THE CAVITIES.

Abdomen.—Dyspepsia.—There are 459 cases of derangement of the digestive organs specially noted, being about 12.7 per cent. It must be understood, however, that it appears in complication with almost every other disease, and indeed in some shape or other afflicts the greater number of the peasantry above the age of thirty. It presents itself in every form; pyrosis, gastrodynia, flatulence, constipation, &c. This remarkable prevalence of indigestion amongst persons living upon the most simple and even sparing diet, would seem to be a practical refutation of the theory of those who propose starvation as a cure for every form of the disease. It must certainly be admitted that excess in drinking ardent spirits is not uncommon, but I have little doubt that the main cause of dyspepsia here is an exclusively vegetable regimen.

Inflammations of abdominal viscera, including dysentery, are 64 in number—1.7 per cent.

Intestinal irritation, from worms, dentition, &c. including diarrhoea and infantile remittent fever, 277 cases, or 7.7 per cent.

Colic and Cholera 25—0.6 per cent.

Hepatic disease 21—0.5 per cent.

Jaundice 17—0.4 per cent. One case fell under my notice in which the disease was suddenly produced in a woman by her being forced to drink off a fluid which powerfully disgusted her.

Thorax.—Inflammations of thoracic viscera and air-passages, including catarrh, cynanche, pleuritis, bronchitis, &c. 293 or about 8 per cent. These diseases were seldom seen until they had existed for some days, and the symptoms had been aggravated by liberal doses of whisky; but when opportunities occurred of observing them in the early stages, they were found to be distinguished by the same mild character as the other forms of inflammation.

Asthma and dyspnœa, 36 cases, 1 per cent.

Phthisis, only 14 cases are recorded, being 0.3 per cent. This appears a very small proportion of a disease which usually occupies such a prominent position upon the medical records of these islands. Many instances of what was popularly called consumption fell under my notice, but they generally turned out to be chronic bronchitis.

It is to be regretted that *post mortem* examinations, a sufficient number of which would set the matter at rest, were seldom permitted to me; but after the most mature consideration, I have come to the conclusion that true tubercular phthisis is of rare occurrence in this part of the country. Upon what local circumstances this depends, I shall not now attempt to explain, but certainly feel disposed to connect it, in relation to a common cause, with the mildness of inflammation and the infrequency of scrofulous affections, which I shall afterwards have occasion to mention.

Diseases of the heart, 7 cases, or 0.2 per cent. One aneurism of the aorta is noted. No case of this affection in any of the other arteries came to my knowledge.

Brain and Nervous System.—*Apoplexy and paralysis*, 22 cases, 0.6 per cent.

Cephalalgia, 50 cases, 1.3 per cent. Many of these were of an intermitting type, of which some yielded to bark and tonics, but others resisted every plan of treatment. In females, the disease was generally connected with derangement of the uterine system.

Neuralgia, 23 cases. A great many instances of toothach occurred, many of which I am convinced were neuralgic in their character. Since I had the pleasure of seeing Dr Macculloch's work, I have attentively watched for indications of the malarious origin of those diseases, but have never found them confined to any peculiar locality. They occurred equally in the highest and lowest places, in the midst of bog and in cultivated ground, and, as far as my observation went, were not any where endemic.

Epilepsy and convulsions, 14,—0.3 per cent.

Mania, melancholia, and hypochondriasis, 9 cases. The two latter classes of disease were only seen incidentally, as patients labouring under them alone rarely applied to the dispensary for assistance.

Hydrocephalus; but one instance is recorded.

HEMORRHAGIES.

Hæmoptysis, 20.—0.5 per cent.

Hematemesis, 8 cases. Many patients were reported to have vomited blood, but on examination the matter ejected was generally found to be dark-coloured bile or depraved gastric secretions.

Epistaxis, 8 cases.

CHRONIC CONSTITUTIONAL DISEASES.

Dropsy is the most frequent under this head. Eighty-three cases are mentioned or 2.3 per cent. It occurred in every form, oftenest

in that of ascites. A decoction of the tops of the common broom, (*Spartium scoparium*) is much employed by the peasantry, and I have frequently found it very serviceable as a diuretic. It may be given to the patient as his common drink.

Scrofula,* 20 cases, only 0.5 per cent., an average remarkably small when we consider the extreme privations suffered by the people,—their defective vegetable diet—the dampness of their dwellings—and the crowded manner in which they occupy them.

Cancer, 18 cases, 0.5 per cent.

Purpura Hemorrhagica. Three cases are on the list, two of which fell under my own care. One of these occurred in the town, and was not seen until the patient was moribund. The other person lived in the centre of a bog, in one of the highest inhabited parts of the district. Although his disease was considerably advanced, and alarming hemorrhages had taken place from all the apertures of the body, he was perfectly restored under the exhibition of wine, sulphate of quinine, and mineral acids.

DISEASES OF PARTICULAR PARTS.

Cutaneous diseases are very numerous. 245 are noted, being 6.8 per cent. These were chiefly obstinate and serious cases, as advice was rarely sought for the lighter forms of eruption, which prevail almost universally amongst the lower classes of the people. A most extensive field for the observation of those distressing and troublesome complaints is afforded by the Dispensary. In every variety, and in every stage and complication they may be seen among the patients, from the strophulus of the new born infant to the incurable lepra of old age. It would be out of place at present to enter particularly upon this subject; but I may remark, that while it must be confessed that many species obstinately resist the most persevering efforts of art, my own experience is sufficient to encourage at least a close investigation of cutaneous disease, and some hope of additional light being thrown upon its nature and treatment.

Diseases of the Eyes of every kind amount to 112,—3.1 per cent.

Diseases of Bones are 24 in number, of which 14 were cases of necrosis.

Diseases of Joints, 26,—0.7 per cent. Some of these were scrofulous in their character.

Diseases of the Uterine System, including *amenorrhœa*, *menorrhagia*, *leucorrhœa*, and *hysteria*, 98 cases, 2.7 per cent.

Diseases of Urinary Organs are rare. Only 21 cases are re-

* The term is intended only to apply to true glandular disease.

corded. Most of these were retention from paralysis occurring in very old persons. There was but one stricture. Calculus is a disease totally unknown in this part of the country, and, as far as I have been able to learn, in the adjoining districts. I met with one case of total suppression of urine; it occurred in a young man, and lasted three days. The symptoms attending it were pain, but not tenderness of the umbilical and lumbar regions; constipation; great anxiety and restlessness; thirst; headach; accelerated pulse. When I saw him, he had been well purged with castor oil, and the disease was evidently yielding. To satisfy the patient a catheter was introduced, and about a wine glassful of pale urine drawn off. A full dose of tincture of opium was then given, which produced sleep for several hours, at the termination of which the urine passed in natural quantity, and as well as it had ever done.

Diseases of the Male Genitals, including *hydrocele*, swelled testicle, &c. are not numerous; only 12 appear on the list.

Hernia is of frequent occurrence, although, from there being no trusses distributed at the Dispensary, it seldom appears on the books, except under particular circumstances. There are 21 cases recorded. The operation was but once required.

DISEASES OF CHILDREN.

The diseases to be enumerated under this head were seldom treated at the Dispensary, merely on their own account. The parents suffered them to run their course, unless the symptoms became very urgent, or other diseases supervened.

Measles, 109 cases, or 3 per cent. These were mostly attended with inflammations of the thoracic or abdominal viscera; much aggravated by the quantities of whisky given, under the impression of its being necessary to "keep out" the eruption.

Variola, 21 cases. The practice of inoculation is still very prevalent, and when the disease is communicated in that way, or caught from persons who have been inoculated, medical aid is never sought. During spring, however, the season which they choose for communicating the infection, numerous and various instances of the sequelæ of small-pox are presented at the Dispensary. Vaccination is slowly extending, but its progress is much retarded by the superstitions and carelessness of the people.

Scarlatina, 8 cases.

Varicella, called here "guirles," 10 cases.

Pertussis, 21 cases.

It will be seen that, for the reasons already mentioned, a fair average of the prevalence of those five diseases is not afforded by the numbers on the books.

A disease which I have not any where seen described, is very common among the children here, and, if not early removed, is productive of much inconvenience; it is a thickening of the frenum of the upper lip, called by the people, "the scurvy tack," which, as the child grows, extends between and separates the two front incisor teeth, producing caries of them, and troublesome ulceration of the gums. When children so affected were first brought to me, I was disposed not to interfere until my friend Dr Read happened to mention to me his experience of the consequences, which I have since confirmed by my own observation. The treatment necessary, and which usually is quite successful, is to remove a small portion of the frenum with a pair of scissors; but if caries has seized upon the teeth, they must be extracted.

I have thus gone through all the important diseases that occurred among the 3600 cases taken as an average. The remainder were either accidental injuries or trivial complaints not requiring particular mention. It has been my object simply to state facts as to local circumstances and usages, which might be supposed to influence health, and also as to the numerical proportions in which disease occurred, but without attempting to connect them in the relation of cause and effect; because it appears to me that our data are still very insufficient for the purpose of generalizing upon this interesting topic. We still want unprejudiced and accurate numerical statements of the results of different men's experience of disease under similar and varied local circumstances, as well as extensive observations upon those circumstances. The only theory we ought to form of the influence of climate and localities upon salubrity, should be strictly an induction from a number of such records.

It is hoped that the view of the subject just put forward will be received as some apology for occupying the pages of the *Medical Journal* with this paper in its present very imperfect state. It was my wish to have furnished comparative tables of the mortality of different ages, but at this time it has been quite out of my power to procure the necessary information. In the remarks upon the topography of the district, some points may have been neglected, but this must be attributed to the want of a precedent, and to the difficulties opposed to extensive literary reference, by my isolated and remote situation, and the nature of the duties belonging to it.

ART. V.—*An Inquiry on the chemical solution or digestion of the coats of the stomach after death, with some observations on softening, erosion and perforation of the stomach in man and animals.* Read before the Royal Academy of Medicine of Paris. By ROBERT CARSWELL, Esq. [From the Journal Hebdomadaire de Médecine.]

IT is unnecessary to request the attention of the Academy to the important subject announced in the title of this paper. Every inquiry, which tends to throw light on the pathological anatomy of the stomach,—an organ which has been considered the seat of so many common and severe diseases,—deserves the most attentive consideration.

The doctrine so strenuously promulgated of late as to the nature of fevers, has derived its strongest support from the morbid appearances presented by the stomach after death from this class of diseases. An almost invariable conjunction of certain general symptoms during life and certain organic derangements after death could not fail to present an apparent concatenation of cause and effect. It led to a doctrine too plain not to be adopted at once by many as true,—too simple not to be eagerly seized on by the young physician, who found in it the means not only of abridging his studies, but likewise of curing almost all maladies. But a more severe system of reasoning, and researches of greater extent and minuteness, and more in harmony with the individual and reciprocal conditions of the constituent parts of organized bodies, and with the laws by which they are governed in the healthy and diseased states, have proved that it is erroneous. Justice has at length been executed on these wanderings of the spirit of system, which pretended to see and explain every thing.

It is in the study of pathological anatomy that the physician constantly seeks for new information respecting the nature of the diseases to which our organs are subject, and the organic alterations which they undergo.

While it must be admitted that this science has already contributed immensely to the progress of medicine, every one will nevertheless feel that it must be prosecuted with more zeal than ever. The approaches to knowledge which pathological anatomy has pointed out, though open and clear, have not always led to truth. The attention of inquirers has been too often confined to the simple examination of the morbid states of our organs, without regarding the local and general causes through means of which these organs contract disease. Allowance has

not been always made for the natural and irregular changes which the products of these organs may undergo of themselves ; and consequently effects, which should have been referred to such spontaneous changes, have been often regarded as the immediate consequence of organic lesions.

These remarks apply particularly to the fluids of the economy. The rigorous observation of pathological facts, which in recent years has been so successfully cultivated, especially in France, has already dissipated a part of the obscurity which has long hung over the diseases of the fluids. In the present day diseased states of the fluids are acknowledged to be the primary source of important and extensive changes, the effects of which may be confined to a single point, or felt over the whole system, and may last but a few days, or run through a long course, or even cease only with life.

It is not my intention, however, to discuss in the present paper the pathological states of the fluids. But among them are some which may produce directly the most severe lesions, or give rise to new formations of the greatest variety, and nevertheless without altering their own nature or undergoing any change except what results from a modification of movement or place. And there is one in particular, which in its most healthy state acts in a remarkable manner, and often produces complete disorganization of the whole or of a part of the organ which secretes it, and also of other organs with which it comes accidentally in contact. I allude to the healthy secretion of the stomach, or the Gastric Juice.

The phenomena now adverted to have been long known ; but by many pathologists they have been little, if at all, looked to in their attempts to determine the nature of certain pathological states of the stomach ; while others have not only neglected them, but even also denied the possibility of their production. It is not easy to conceive how any one could so far disregard or undervalue the influence of the gastric juice in occasioning certain organic injuries both before and after death ; since it is the peculiar property of this fluid to change, and in a manner to reduce to their most simple elements, all animal substances subjected to its action. To a certain degree, however, the explanation of this strange departure from the sound principles of pathology and physiology will be found in the almost exclusive share which most modern pathologists have assigned to inflammation in producing every species of organic disorder in the organs of digestion.

In order to study with advantage the pathological anatomy of the stomach, or indeed of any other organ, the attention ought not to be confined simply to the derangements of struc-

ture revealed by dissection, or to the symptoms. It must be turned also to the investigation of their causes.

Two descriptions of causes ought to be laid down, by the operation of which softening, erosion and perforation of the stomach may take place. These alterations may arise, on the one hand from causes originating in the organization of the stomach itself, and on the other hand from causes developed within it, or derived from without. The former depend on certain modifications of nutrition, or an unnatural secretion from the stomach. The latter are constituted by chemical agents, or poisons, or putrefaction. The former, it is evident, can only arise during life; while the latter may come into operation both during life and after death. In tracing therefore the history of organic derangements of the stomach, it is essential to hold in view the causes here enumerated, for the purpose of settling the nature of each derangement of structure, and the rational treatment of the diseases depending on it, as well as the means of solving more than one important question in medical jurisprudence.

It is easy to convince one's-self that those who have investigated this subject have not always been fully aware of the importance of the distinctions now specified; for they have often confounded together derangements of structure resulting from different causes, and have consequently been led to form opinions more or less erroneous, respecting their nature. Keeping out of view the effects produced on the stomach by the direct action of substances introduced into it from without, it will be found that modern pathologists attribute softening and perforation of this organ, 1. to inflammation, chronic or acute; 2. to gangrene; 3. to putrefaction; 4. to fluids developed within it by morbid causes; and 5. to the gastric juice. In the succeeding observations it is my purpose to consider the last of these agents; which, I have already remarked, has been almost entirely forgotten, or so little studied, that we are still in ignorance as to the part it performs in the production of the numerous derangements of structure presented by the stomach. It is impossible to settle the importance of other agents, without first acquiring more positive information of the effects of the gastric juice.

Before explaining my own opinions as to the influence of the gastric juice on the stomach after death, it is necessary to present a rapid sketch of the inquiries of other pathologists, in order to show how far they have demonstrated this influence in the production of softening, erosion and perforation of the stomach.

It is well known that *John Hunter* was the first to announce, that perforation of the stomach may be produced by the im-

mediate action of the gastric juice after death ; and read a paper on the subject before the Royal Society of London in 1772. In this paper he observes, " the appearance which has been hinted at is a dissolution of the stomach at its great extremity ; in consequence of which there is frequently a considerable aperture made in that *viscus*. The edges of this opening appear to be half-dissolved, very much like that kind of dissolution which fleshy parts undergo when half-digested in a living stomach, or when dissolved by a caustic alkali, viz. pulpy, tender and ragged.

" In these cases the contents of the stomach are generally found loose in the cavity of the *abdomen*, about the spleen and diaphragm. In many subjects this digestive power extends much further than through the stomach. I have often found that after it had dissolved the stomach at the usual place, the contents of the stomach had come into contact with the spleen and diaphragm, had partly dissolved the adjacent side of the spleen, and had dissolved the diaphragm quite through ; so that the contents of the stomach were found in the cavity of the *thorax*, and had even affected the lungs in a small degree.

" There are few dead bodies in which the stomach is not at its great end in some degree digested ; and one who is acquainted with dissections can easily trace the gradations from the smallest to the greatest.

" To be sensible of this effect nothing more is necessary than to compare the inner surface of the great end of the stomach with any other part of the inner surface ; what is sound will appear soft, spongy, and granulated, and without distinct blood-vessels, opaque and thick ; while the other will appear smooth, thin and more transparent ; and the vessels will be seen ramifying in its substance, and upon squeezing the blood which they contain from the larger branches to the smaller, it will be found to pass out at the digested ends of the vessels, and appear like drops on the inner surface.

" Those appearances I had often seen, and I do suppose that they had been seen by others ; but I was at a loss to account for them ; at first I supposed them to have been produced during life, and was therefore disposed to look upon them as the cause of death ; but I never found that they had any connexion with the symptoms ; and I was still more at a loss to account for these appearances, when I found that they were most frequent in those who died of violent deaths, which made me suspect that the true cause was not even imagined.

" The first time that I had occasion to observe this appearance in such as died of violence and suddenly, and in whom therefore I could not easily suppose it to be the effect of disease

in the living body was in a man who had his skull fractured and was killed outright by one blow of a poker. Just before this accident he had been in perfect health, and had taken a hearty supper of cold meat, cheese, bread and ale. Upon opening the *abdomen* I found that the stomach, though it still contained a good deal, was dissolved at its great end, and a considerable part of these its contents lay loose in the general cavity of the belly. This appearance puzzled me very much. The second time was at Saint George's Hospital in a man who died a few hours after receiving a blow on his head, which fractured his skull likewise. From those two cases among other conjectures about so strange an appearance, I began to suspect that it might be peculiar to cases of fractured skulls; and therefore, whenever I had an opportunity, I examined the stomach in every person who died of that accident: but I found many of them which had not this appearance. Afterwards I met with it in a soldier who had been hanged."—[Philosophical Transactions, lxii. 450.]

Hunter, who at this time was prosecuting his experiments on digestion in different animals, sometimes found their stomachs in the state now described. He likewise found it similarly dissolved in fishes, which, as he remarks "are deprived of life suddenly, while in full health, and generally while their stomachs are full of food." He observed that a part of the stomach was in the same state as the substances it contained. The contents were frequently little fishes, which had been swallowed entire, and which, as they could not pass wholly into the stomach, were partly contained in the lower portion of the gullet, so that those parts only which projected into the cavity of the stomach were dissolved by the gastric juice. It was then that Hunter discovered the source of an appearance, which had seemed to him so remarkable and difficult to explain. "Being employed," says he "on this subject, and therefore enabled to account more readily for appearances which had any connexion with it, and observing that the half-dissolved portions of the stomach, &c. were similar to the half-digested food, it immediately struck me that it was from the process of digestion going on after death, that the stomach, being dead, was no longer capable of resisting the powers of that menstruum, which itself had formed for the digestion of its contents." (P. 253.) It will be seen by-and-by that Hunter was not mistaken as to the true cause of perforations of the stomach.

Hunter, then, regarded perforations of the stomach as arising always after death, and as the effect of the direct action of the gastric juice on the stomach. He further demonstrated that they occurred in persons in full health; and he even considered this an essential circumstance, in order that the gastric juice

might be in full activity. Yet, notwithstanding his knowledge of their cause, and the accessory circumstances in which they occur, it does not appear that he ever succeeded in producing perforations at pleasure;—which ought to be practicable, if the principles he lays down are admitted.

Spallanzani, in his brilliant experiments on digestion, confirmed the accuracy of Hunter's views in regard to fishes, but he could succeed only in a very imperfect manner in proving his results with other animals.

Adams attempted to solve this difficulty. In order to explain why digestion of the stomach does not take place in all animals that are killed while in full health, he had recourse to the opinion of Hunter as to the difference between real death and the apparent death which occurs in asphyxia. He tried to prove, that in order to produce digestion of the stomach after death, the death of the animal must be not only sudden, but also real, that is, must take place at once throughout all the constituent parts of the animal. He therefore endeavoured to produce this state of real death, which, according to him, occurs whenever the blood does not coagulate, or the limbs stiffen after death. He killed two dogs, one by a blow on the epigastrium, another by electricity. In the former only was the stomach perforated; and in the former alone was the blood fluid and the stiffness of the body wanting. He also observed the same phenomena in two rabbits, one of which was killed by a blow behind the head, the other by section of the spinal chord. In the former only were the signs of real death present, and the stomach perforated.

Adams farther conceived that heat contributed to produce the perforations; for in both the animals in which he succeeded in causing perforation, the body had been exposed to the sunshine. We shall afterwards see how far his opinions are well-founded.

Allan Burns, who soon afterwards published a paper on the Digestion of the stomach after death, also admits the exclusive operation of the gastric juice, and even assigns it a more extensive influence than was given by Hunter. Like Hunter he remarked, that perforation generally occurred in the great sac of the stomach; but he likewise remarked it thrice on the anterior surface, and once near the pylorus. He farther found it thrice in emaciated subjects, where death occurred after tedious diseases. *Burns*, then, noticed the important fact, that perforation of the stomach by the gastric juice occurs in individuals extenuated by lingering diseases; and I may add, that in similar circumstances he noticed softening of the mucous membrane of this organ. But although he acknowledges with Hunter that the stomach is digested by the gastric juice secreted before

death and collected in the great sac by the depending position of this part, he nevertheless conceives that digestion is not always occasioned in this manner, but that the gastric juice contained in its proper vessels may likewise have the same effect, as in the three instances where he found the perforation on the anterior surface of the stomach.

Here ends what may be termed the first period in the history of this subject. In that which followed it will be seen that the truths established by Hunter were not subjected to the test of observation and experiment. But under the influence of the doctrines of the day, they were first modified, then disappeared, and at length were replaced by hypotheses. The dissolution of the dead organized parts instead of being ascribed to a mere physiological agent, was looked on as unfolding the operation of a pathological agent, which manifested itself by a succession of the most violent symptoms, and left behind it more or less extensive ravages in the organ of digestion. Still, however, a fluid was believed to be the agent in producing these pathological phenomena: The agent was still thought to be the gastric juice, but become extremely acid under the influence of some peculiar modification of the nervous system, and aided in its action by the parts with which it was in contact being previously in a state of disease. Such was the doctrine of *Jäger*. This author remarks in his first paper in *Hufeland's Journal* for 1811: "I at first thought Hunter's opinion generally well founded. Ulterior observation, however, convinced me that it was by no means satisfactorily demonstrated, and that the diseased appearance in question ought not to be considered as a purely chemical effect subsequent to death, but depends partly on circumstances occurring during life. There is a specific form of disease after which softening of the great sac of the stomach takes place; and this alteration does not occur, at least frequently, without some pre-existing disorder. I may with justice say, that it is never produced singly by the chemical action of the natural gastric juice on a healthy stomach; but that it is the result of some change which the gastric juice undergoes during life, and through means of which its chemical action becomes possible."

In his second paper, published in 1813, *Jäger* gives more extension to his doctrine, and believes he has discovered in what this change consists. "The intestinal canal," says he, "appears to me to contain in its natural state free acetic acid, which may either be a secretion or proceed from the aliment. But the formation and action of this acid depend in the living body on the integrity of the nervous influence and the reciprocal action of the organs. For we see that indigestion, accompanied by the formation of too much acid, arises under the influence of causes

which derange nervous action,—for example, when the *par vagum* is divided, in many diseases of the brain, or under the operation of narcotic poisons acting on the inner surface of the intestinal canal.—When a disease arises, it acts on the nervous system, which alters the secretion of the intestinal tube, and the reaction of the tube on its contents: This occasions the formation of an unnatural quantity of acetic acid; and the acid in its turn produces the disease I have described, which terminates in the gelatiniform dissolution of the membranous organs where the disease resides.

“Although the alteration I have described is owing to morbid changes occurring during life, and is the effect of vital agents, yet the destruction of the stomach may be the consequence of a particular chemical and animal operation. In the generality of cases, the changes which the membranes of the stomach undergo are most distinct where the fluids accumulate and remain longest; and these changes commonly extend from a central point towards the circumference, and also pass to other organs in contact with the dissolved part of the stomach, such as the diaphragm, peritonæum, and lungs.”

Jäger at first thought that the primary injury of the stomach extended itself during life, like cancer and other similar diseases; but an observation of Burns led him to conceive that it may extend after death; and he afterwards became convinced of this from two experiments of his own, where softening and perforation took place in the stomach and intestines, which he had taken from the bodies of infants, and kept in contact with the liquid contained in them at the time of the dissection. These two experiments, with the conclusions drawn from them by *Jäger*, will be noticed afterwards.

In the opinion of *Chaussier*, too, perforation of the stomach is a vital phenomenon; but complex; “a primary and special irritation of the coats of the stomach, occasioning the secretion of an acrid, corrosive liquid, which turns its activity against the very tissue that secreted it, or any other tissue that comes in contact with it.” In two Theses by *MM. Morin* and *Laisné*, pupils of the professor just quoted, perforation of the stomach by digestion is reduced to one of the most common phenomena in pathology. “Must we admit,” says *Laisné*, “with Hunter, that the prolonged contact of the gastric juice with the stomach in abstinence, may occasion the perforation of that organ? The physiology of the day will not admit this assertion.” And farther on he adds, “The assertion of Hunter is false: without a doubt he allowed himself to be misled by the effects of an irritation which had invaded the stomach, when this organ had, by its action of chymification, consumed all the juices in its cavity,

and was in consequence completely dry." All the phenomena in question, according to M. Laisné, depend on "the developement of a morbid erosive, or ulcerative action, which breaks out suddenly in a particular part of the stomach."

As for *M. Morin*, the perforation of the stomach is in his opinion owing to "erosion,—a very complex, morbid action, essentially originating in the action of the solids, and depending on a certain degree of irritation, which successively induces stagnation of the fluids in the texture of a part, developement of its vessels, increase in their action, a change in circulation and nutrition, and in the end liquefaction of the molecules that compose the tissue."

Lastly, in the latest works mention is no longer made of the inquiries of Hunter or the other authors who have supplied the most important facts connected with this subject; or, if they are mentioned at all, it is always in a very secondary manner. Nevertheless, the subject of inquiry is still the same alteration in the same organ, presenting itself under precisely the same aspect, and modified merely by accessory circumstances, general or local. Under the present head must be arranged "the gastro-intestinal disease, or infantile gastritis and enteritis with gelatiniform disorganization" of *Professor Cruveilhier*, and the "softening with ulceration and destruction of the mucous membrane of the stomach" of *M. Louis*. These distinguished pathologists conceive they have described under the preceding titles, new pathological states never described before; but a glance at the inquiries of which I have just given an abstract, and particularly at those of *Jäger*, who has related a considerable number of cases of softening and perforation both of the stomach and of the intestines, will show that the appearances in question had already been well described, and that several authors had drawn more correct inferences than themselves as to their nature.

I shall not stop to demonstrate the identity between the alterations of structure which are the proper subject of this paper, and those described by *MM. Cruveilhier* and *Louis*. Indeed, *M. Cruveilhier* is at one with me on the matter. But his theory is the following. "Acute spontaneous perforations are always preceded by gelatiniform softening, with thickening of the parietes of the organ. They may occur in the small and great intestines, as well as in the stomach; nay, they have been even observed in the gullet. Gelatiniform softening proceeds always from the inside outwardly. At first there is merely separation of the fibres by a gelatinous mucus; presently the fibres themselves are attacked, become transparent, and at length disappear, so that the softened stomach or intestine resembles a transparent

jelly rounded in a tubular form. If the gelatiniform disorganization is complete, the disorganized parts are swept by little and little away, so that what remains appears attenuated. In every instance of perforation of the stomach or intestines, originating in this alteration, the altered part and its vicinity present neither change of colour, nor vascular injection, nor gangrenous odour. Boiling in water, which converts the stomach and intestines into jelly, gives a perfect idea of the appearance they assume on undergoing this change. Is it possible not to recognize in the causes of this disease, in the kind of injury which constitutes it, and in the treatment which is most suitable, a powerful irritation from which results a repeated afflux of white fluids, naturally destined without doubt for exhalation, but which encountering too delicate a texture, distends and disorganizes it, and penetrates it as if it were an inert body?"

I need hardly add, that *M. Broussais*, who was well acquainted with the first paper of *Jäger*, regards the alterations we are considering as the consequence of a *gastro-enteritis*, and proposes a corresponding treatment.

M. Andral, in his *Pathological Anatomy*, has stated the opinions of several of the authors quoted above; from which, as well as from his own views, he concludes that the facts we possess in regard to softening and perforation of the stomach by the gastric juice after death "ought to be taken into consideration, but that they are not sufficiently numerous or circumstantial to render it possible to come to a precise opinion without farther observations." As to softening of the stomach, he thinks "it ought to be arranged with the alterations in structure which may in certain cases occur after death. During life there may be a morbid state of the stomach, announced by well-marked functional disorder, and which unfolds itself after death by producing softening of the stomach,—this morbid state having brought the stomach into such a condition that it softens after death under the action of causes, which, without the previous morbid state, would have been inert."

Before concluding this section of my paper I must quote the thesis of *Doctor Bernard*, "on Spontaneous Perforations of the Stomach, observed after death from violent grief and great surgical operations," and a paper by *Dr John Gairdner*, of Edinburgh, entitled *Cases of Infantile disease, in which Erosions and Perforations were found in the Alimentary Canal after death*.

M. Bernard says, that "pain and lively emotions of the mind may be regarded in certain cases, as the exciting causes of spontaneous perforations of the stomach." As to the proximate cause, he conceives this to be the "special irritation" of *Chaussier*, and adds in a note, "having been anxious to learn the opinion of this professor as to the influence of pain in producing

spontaneous perforations, I learned, to my great satisfaction, that his ideas on the subject were conformable with my own."

Dr Gairdner, who has seen and faithfully described the same appearances which have occupied the attention of the French and German pathologists, gives a summary of his views at the end of his paper to the following purport. 1. Erosions and perforations of the stomach and other parts of the alimentary canal, of a different nature from those produced by ulceration, are found in infants who did not present during life any symptom of disease in these quarters, and who from the symptoms and anatomical changes remarked after death, appeared to perish of other diseases. 2. Similar erosions and perforations are found in infants who die of a particular disease, recognizable during life by very prominent symptoms of a kind to lead the physician to suppose the alimentary canal is the seat of disease. 3. In both instances the erosions and perforations are produced by the action of the fluids of the alimentary canal after death. 4. It is probable that in the first description of cases erosion takes place without any pre-existing disease in the eroded parts: but in the second it appears that organic changes exist during life, by which a part of the alimentary canal is rendered more soluble in its own fluids. 5. Erosion after death does not always follow this morbid alteration,—a circumstance depending probably on a deficiency in the quantity or solvent power of these fluids.

I might here quote a multitude of cases of perforation of the stomach recorded by other authors; some of whom view them more or less in the same light with the authors already cited, while others regard them as the effect of gangrene or putrefaction. But it is perhaps better to rest content with what has already been said on this department of my subject. Before quitting it, however, it may be well to add, that one author has even tried to call in the aid of softening and perforation of the stomach by digestion, in order to demonstrate the influence of that organ on the brain. *M. Sablairoles* is the pathologist to whom the honour of this idea is due. In speaking of perforations of the stomach he observes. "By what mechanism are these perforations accomplished? Several observers have attempted to solve the problem; but I shall pass over in silence the opinions which Hunter and his enthusiastic pupil, Adams, as well as Alphonse Leroy, Spallanzani, Sömmering, Cruickshank, Jäger and others have maintained, because I regard them all as hypothetical, and possessing therefore only a very secondary interest,—in order to arrive at once at the opinions of *M. Broussais*. This author has established, that the perforations in question are the effect of nothing but inflammation, of which, I may add,

gelatiniform softening is almost always the prelude. I say almost always, because ulcers of the stomach, which are by no means rare as the consequence of chronic gastritis, may equally produce them. It appears to me extremely difficult to admit the occurrence of perforations, without one or other of these morbid modifications." This passage is quoted as an example how far popular doctrines may fetter the physician's mind and lead him to pervert the most palpable facts. The opinions previously referred to will bear witness how general this careless manner of thinking is become, and with what levity the most simple and striking facts are rejected, although ascertained, after numerous researches and express experiments, by men whose investigations have immortalized them.

I have not hitherto spoken of the symptoms ascribed to softening, erosion, and perforation of the stomach. Neither shall I now enter into any details on the subject, because all the symptoms may exist without any appreciable morbid appearance being found in the digestive organs after death,—because all the alterations in question may be found without being preceded by the symptoms imputed to them,—and above all, because my object is not to describe pathological phenomena. I shall merely remark, for the purpose of confirming and clearing up my own views, that these symptoms may be arranged in two groupes, —those connected with some disorder in the organs of digestion, and those proper to injuries of other organs. In the former groupe are to be found the same symptoms which are observed in gastritis or gastro-enteritis, acute or chronic, simple or complicated with a sympathetic disorder of some other organ, more particularly of the brain. In the second are found the symptoms of acute and chronic inflammation of the brain and its membranes, the lungs and their enveloping membrane, of phthisis, of puerperal peritonitis, and other maladies, and likewise those which follow grief and the acute emotions of the mind. In some of these disorders there has been a concomitant disturbance in the functions of the stomach; in others little or none.

It remains for me to describe the anatomical characters of softening, erosion, and perforation of the stomach; but these characters are so well known by every body, that it is unnecessary to repeat them here. Besides, an opportunity of mentioning them will occur when I explain the results of my experiments, and endeavour at the same time to point out the resemblance of the characters in question to those of the changes of structure which are found in the bodies of persons who have died suddenly while in full health, or which are produced in animals in the same circumstances.

Meanwhile I may make a few remarks on the information on

this subject, which has been communicated by various prior authors. Certainly one of the most striking and important of the circumstances resulting from the mass of facts already published on spontaneous perforations of the stomach, is their seat in the great *cul-de-sac* of that organ. This is so constantly their seat, that the cases in which they have been met with elsewhere can be regarded only as rare exceptions to the general rule. What is here said of perforation, applies equally to softening and erosion. It is in this part of the stomach, on account of its form and position after death, that fluids accumulate and rest under the influence of their own gravity. But besides these alterations of the stomach itself, we have seen that others perfectly similar have been at the same time met with in other organs, and that these organs, in their natural position, are in contact with that part of the stomach which is almost invariably the seat of the primary alteration. Such are the liver, diaphragm, spleen, left lung and intestines.

Another circumstance not less remarkable is the extension or progress of these alterations in a direction in which a fluid alone could act, or be carried, together with the total absence of any trace of redness or other phenomenon of inflammation, such as adhesion, or the formation of lymph or pus. And yet pathologists have brought themselves to believe in the existence of an acute irritation, of inflammation ending in ulcers and perforation,—without effusion, and without those mortal symptoms which alarm and warn the most inattentive physician whenever the stomach is really perforated! It is true that acute pain and vomiting have manifested themselves in many patients, in whom the stomach has been found perforated. But these symptoms, instead of leading to the belief in perforation having occurred during life, ought to have conducted a judicious observer to the very opposite conclusion; for, when no escape of the contents of the stomach into the abdomen was found, nor its inevitable consequence, peritonitis, it should have been quite plain that the appearance in question was produced after death, and was quite independent of the operation of any vital cause.

It may be said, that these perforations do not occur till the very moment of death, and consequently that peritonæal inflammation could not take place. But facts are too searching for such a supposition to stand: The peritonæum is found destroyed like the stomach itself; and various organs are traversed from one part to another, without any trace of the vital process which is supposed to operate.

Whatever be the light in which we regard these spontaneous perforations, it is impossible to avoid the consequences which follow when they are once admitted as *morbid* pheno-

mena. No one has ever thought of questioning the reality, frequency, and fatal consequences of spontaneous perforations of the intestines, where the symptoms during life and the appearances after death explain one another in a clear and satisfactory manner. Here is a concatenation of cause and effect, the most constant and most evident that is furnished by the whole immense series of morbid phenomena which pathology has presented for our contemplation. It signifies little whether there is redness or paleness of the tissues. Thickening, not by serous infiltration, but by matter more or less solid becoming incorporated with the diseased tissues, and above all induration of these tissues, which never occurs in perforations by digestion, mark at once the period at which these changes happen, and their pathological nature.

Returning now to the stomach, we find there too, as in the intestines, spontaneous perforations. There we have the same textures, the same alterations, but not the same consequences. Almost all the neighbouring organs form a barrier, if not to the progress of the disease, at all events to the escape of fluids. Nothing is more rare than perforation of the stomach with effusion of its contents, while this organ is frequently found perforated in several places, and the openings plugged up by the adjoining organs. But these organs are not in simple contact, or juxtaposition, as in perforations produced by digestion: They adhere around the apertures by the medium of a new tissue more or less completely organized, and developed by adhesive inflammation. Another important peculiarity relative to such spontaneous perforations is their seat, which is the very opposite of that of gelatiniform perforations. The latter we have seen are almost always in the great sac of the stomach: The former are almost always seated in the pyloric portion. The great peculiarity, however, in the gelatiniform perforation, and one to which it is impossible to attach too much consequence, is the absence of effusion of the contents of the stomach. The matters contained in the stomach seldom pass into the sac of the peritonæum; and when really found there, this is easily explained, at least, in the generality of cases, by the viscera being displaced in the handling of them, and by shocks given to the dead body, or other similar circumstances. Now there is a cause which acts during life in the most powerful manner, and which ought to expel partially or entirely any liquids contained in the stomach, if this organ was perforated during life. This is violent and frequently repeated vomiting which has occurred in many individuals in whose bodies perforations were found. The vomiting has even continued till within a few hours of death;

yet no escape of contents could be observed, although the diaphragm was perforated opposite the hole in the stomach.

The preceding considerations render it, I conceive, difficult to admit these perforations to be morbid appearances, produced during life and related to the symptoms which authors have ascribed to them or to other analogous changes. But if there is still any doubt on the subject, let us interrogate the simplest facts, where disease does not interfere to disturb our inquiry, and to conceal some influence as powerful perhaps as it is fugitive. Let us take the instance of a man who, so to speak, takes but a single step from life to death; who, young and vigorous, and soon after a hearty meal, is struck down by an unexpected blow while in a state of untroubled health, and dies on the spot. In a few hours his body is opened; and the stomach is found perforated or dissolved, like the food. Here the problem is easy of solution: Here we see the organ performing its function,—and digestion, the phenomenon which results. The stomach is digested; for the blow struck the head, and no organ presents any trace of disease or of putrefaction.

But may we not go a step farther, and produce these perforations at will, since they simply depend on the cessation of life in a physiological point of view? Take certain animals, ascertain that they are healthy, kill them, and you will find their stomachs more or less digested, and presenting the very same appearances with those which many pathologists ascribe to diseased conditions of that organ. I shall now prove that by a very simple process complete perforation of the stomach, and sometimes too of the adjoining organs, may be produced *at pleasure*.

In order to facilitate the solution of the various questions involved in this inquiry, I shall present in a tabular form all the real and supposed causes of softening, erosion, and perforation of the stomach, so that we may have them constantly under our eye in discussing the phenomena of the experiments about to be detailed. I shall arrange them in the order which appears to me the most simple, and in which I propose to examine them.

First set of causes.—1. The gastric juice possessed of its customary qualities in the cavity of the stomach or in its proper vessels. 2. The same fluid modified by the influence of the nervous system, excited by a particular disease of the organs of digestion.

Second set of causes.—1. An acrid, corrosive liquid produced by irritation of the mucous membrane. 2. Irritation exciting an organic change, such as softening, erosion and perforation.

Third set of causes.—1. Gangrene. 2. Putrefaction.

Experiments on Rabbits.

First Experiment.—A female rabbit, eleven months old, fat and healthy, was killed by a blow on the back of the head at the commencement of October, and suspended by the hind-legs. In nine hours it was examined. The carcase at this time was stiff, its depending parts congested, its upper parts pale.

When the cavity of the belly was laid open, the great curvature of the stomach, where it projected between the liver and intestines, presented no unusual appearance; but on arriving at the great sac, which had been the most depending part of the organ, we could discern through its serous coat the food with which it was filled. On touching this part of the stomach with the finger, a degree of fluctuation was perceived; while elsewhere, and especially near the pylorus, there was more or less resistance. When raised between the fingers the coats crumbled to pieces, like a recent pseudo-membrane. Here the serous coat, softened in the manner now described, alone separated the food in the stomach from the adjacent viscera. At a greater distance the muscular coat was found pale, softened, and bare of mucous membrane over an extent equal in size to a crown-piece. The mucous coat retained its natural grayish or slightly yellowish colour where it was not destroyed; and where destroyed it lost itself on the muscular coat by a very irregular border, more or less softened.

The bran which the animal had eaten was merely moistened in the pyloric portion of the stomach, where it appeared as if moulded. In the cardiac portion on the contrary, it was very soft, like thick pap, and of a much deeper colour. Chyme was found here and there on the surface of the aliment; but in the great sac it was much more liquid than elsewhere, and was mingled with the softened tissue of this part.

The intestines were healthy, and contained a large quantity of matter. The abdominal ramifications of the vena portæ were much congested. The other organs did not present any remarkable appearance.

Second Experiment.—A female rabbit, five months old, in perfect health, strong and fat, was killed in the same way as the former at eight in the morning of the 15th October, an hour after it had taken a meal, and was hung up by the hind-legs for five hours before it was examined. At the time of the examination the body was stiff, the membranes of the eyes injected, the ears bluish, the muscles of the head, neck, and fore-legs, in short all the depending parts injected, more or less red, and contrasting singularly with the paleness of the upper parts.

The stomach preserved its natural place in relation to the neighbouring organs, but on account of the position of the body, the arch formed by the great curvature was directed from above downwards and from before backwards, so that the great sac was the most depending part of the organ. The lower surface of the pyloric portion, and a part of the cardiac portion rested on the liver, while the upper surface was covered by the intestines. On separating these organs from the stomach, the latter at first seemed uninjured; it was distended, firm to the touch, and of its natural colour. But on reaching the great sac, I could not discover any trace of its coats: a matter like half-coagulated white of egg, or a thickish mucoaity occupied their place. The layer of this substance was in contact on one of its surfaces with the aliment, which projected slightly above the level of the serous coat, and on the other surface with the peritonæum reflected from the loins on the diaphragm; and the peritonæum here exhibited incipient softening, without redness or any other change of colour. The edge of the opening in the great sac was formed externally by the serous membrane, which was pale, macerated as it were, terminated by a fringe or irregular prolongations, and lost itself insensibly in the pulpy matter which occupied the place of the destroyed coats. The stomach was cut open along its lesser curvature from the cardia to the perforation. The bran which the animal had eaten, and with which the stomach was filled, but not to distension, had not the same colour and consistence in the pyloric and cardiac regions. In the former it was grayish-yellow, slightly moistened, but tolerably firm, so as to retain the form of this part of the stomach, and lined with a thick layer of chyme of the colour and consistence of a mixture of flour and half-boiled white of egg, which adhered to the mucous membrane and could be lifted from it in pretty large flakes. In the cardiac portion on the contrary the aliment was of a deep greenish-brown colour, and did not retain the shape of the stomach, but was spread like thick pap over the surface of the membranes. Here there was also chyme, but much more liquid, and mingled with the debris of the subjacent coats which had undergone a similar change with the food. On the greater part of the inner surface of the stomach the mucous coat no longer existed. It terminated by irregular, softened edges, perfectly pale on their free extremities, but possessing more and more of the natural colour and consistence, the nearer it was examined to the healthy remnant of it. The muscular coat, where laid bare by the destruction of the mucous coat, was equally pale and soft at some points, and presented several scattered fibres which were confounded with

the fringed edge of the perforation. Every where else the membranes retained their natural colour and consistence.

A part of the liver in contact with the cardiac end of the stomach had lost its whitish colour. The structure of the liver was scarcely perceptible in this part, its true component parts being confounded together, and possessing merely the consistence of brain. The intestines were full of contents, and, together with every other organ, healthy.

Third Experiment.—A female rabbit, in the same circumstances with the two preceding, was killed and hung up in the same manner for six hours, when it was examined. The body was stiff and the depending parts congested.

The stomach bore the same relation to the neighbouring organs as in the two previous instances; it was also of the same form, degree of fullness, and colour; and the only injury that existed in it was concealed at the bottom of the left hypochondrium, where the great sac was situated. Here the most depending part, which rested on the diaphragm, presented an aperture an inch and a-half in diameter, from which liquid aliment issued, on the stomach being raised. The corresponding portion of the diaphragm was equally destroyed; but the perforation was complete only over a small extent, so that the food had not passed into the cavity of the chest. The softening of the pleura was more extensive than the perforation; and the whole peritonæum corresponding with the great sac of the stomach had entirely disappeared. There was no redness at any of these parts. The stomach presented internally almost the same alteration of its coats as that remarked in the two former cases; and the alteration was limited to the great sac. The fluidity of the food was also observed only in the left portion of the stomach. The duodenum contained a considerable quantity of chyle.

Almost the whole concave surface of the left side of the liver was pale, as it were macerated, and so soft that a layer of it could be removed by the slightest friction. The venous trunks of the stomach, the vena cava and vena portæ were gorged with blood. The other organs were in their natural state.

Fourth Experiment.—A very strong rabbit, after being fed like the others, was knocked on the head and hung up in the same manner. An interval of five hours was allowed to pass before the body was examined. It was then rigid, and all the lower parts congested.

The intestines in a great measure concealed the stomach, the colour, consistence, and fullness of which were natural. Without stirring it we perceived that the great sac was perforated where it rests on the diaphragm. The aliment which was issuing by

the hole formed a slight projection like a collar. Before examining the stomach farther, the state of the diaphragm within the chest was ascertained. Here the same appearances presented themselves much more distinctly than in any previous experiment. On raising the left lung, it was found, that aliment of a dark-brown colour was passing through the diaphragm by an aperture on the left side of the vertebral column ; and from this point to the very apex of the lung a stream of the same matter occupied the channel formed by the ribs with the spine. The costal pleura and periosteum, wherever this matter had flowed over them, were no longer in existence, or were converted by it into a sort of blackish pulp. Two fingers could be passed through the aperture in the diaphragm, the edge of which was irregular and soft, and broke down under the slightest friction. With this the aperture in the great sac of the stomach corresponded. The serous coat forming the border of the latter showed the colour of the alimentary contents through it, which announced the complete and more extensive destruction of the other coats. The aliment had undergone the same changes as in the former experiments. It was moulded in the pyloric end, and connected to the mucous membrane by a thick, firm chyme ; but in the great sac it was more or less liquid. In the latter quarter no trace of the mucous coat could be found, except some softened fragments mingled with the remains of the muscular coat. In the other parts of the stomach, its mucous membrane preserved its natural colour and firmness.

The duodenum was healthy, internally of a rose colour, and contained a considerable quantity of yellowish chyle. The other organs of the body presented no particular appearance.

In all these, as well as many other similar experiments, I observed changes which will aid materially in explaining the organic lesions just described. These I shall at present merely indicate. They are the decolorizing and softening of the intestines which rested on the upper surface of the stomach ; a change of the colour of the blood to dark-brown or black ; and the chemical state of the liquid in the stomach, which strongly reddened litmus.

Any one of the preceding experiments would have sufficed to establish unequivocally the cause and nature of the alterations remarked in them. But my object was to demonstrate at the same time the progress of the alterations, and the several stages through which they pass from simple softening to completed destruction, not only of the organ which is their primary seat, but also of other organs more or less remote from the stomach, and consequently from the producing cause. The same experiments were made

very frequently, and the same lesions were always produced, so that the material facts which result from them, in whatever manner they may be explained, must be admitted as the most positive and invariable that it is possible to conceive.

The subjects of my experiments were exempt from disease, and consequently, the phenomenon which I was in search of was presented entirely without any pathological complication. The object was to observe the state of the stomach in healthy animals killed during digestion, and examined some time after death. The rabbits, accordingly, were at the moment of death in perfect health, and in the act of digesting a meal. In each instance food was found abundantly in the stomach; and wherever digestion was going on most actively, or an accumulation had taken place of the products of secretion, there the organic alterations had also occurred. In all we have seen that digestion was going on most actively in the great sac, or at least the food was there mixed with the largest quantity of fluid; and this was accordingly the chief or almost exclusive seat of these alterations. The great sac was also in my experiments the most depending part of the organ, where the fluids following the law of gravitation must necessarily collect. Such is the prime circumstance in my inquiries, which exhibits with the utmost clearness the active cause, its source and its effects. It is impossible to conceive the cause to be any thing else than the natural secretion of the stomach, possessed of solvent properties, and producing effects equally constant and characteristic of its peculiar action.

The stomach being suddenly arrested and deprived of life, while in the act of discharging its functions, it was submitted to the action of the fluids which it had just secreted; and it underwent essentially the same changes which dead organic matter undergoes during the act of digestion in a living stomach,—namely, paleness and more or less complete softening, conversion of the coats into a liquid pulp, and finally mixture of this pulp with the proper alimentary matters. All of these changes we have seen were produced in each of the rabbits subjected to experiment,—changes which correspond completely with the erosions and perforations considered by some authors as morbid appearances; and we have also been able to trace their progressive stages. It is especially worthy of remark, that the organs besides the stomach in which the same changes were met with, were not merely those alone which were in contact with the stomach, but likewise only those which, from their depending position, were either in immediate contact with its great sac, or in situations which the alimentary matters were traversing. Thus, softening and perforation were found in the diaphragm where the alimentary contents which had issued from

the stomach were resting, and in the costal and pulmonary pleura, or the peritonæum, to which the matter had flowed after passing through the diaphragm. It is impossible not to recognize in the successive order of these changes the operation of a common cause residing in the stomach, directing itself thence towards other organs, and then effecting their solution.

The destruction of so many organs at one time and in the same manner cannot admit of any other explanation, even although the material cause concealed itself from our search. In all these experiments, I repeat, healthy organs and healthy products were alone the subject of observation; and consequently we can look for the cause of the injury of the former only in the natural properties of the latter. The softening, erosion, and perforation of the stomach could not be produced in my experiments but by its own secretions; and we are compelled to consider these secretions as natural, because they had just been formed by a healthy stomach, and their presence was followed by phenomena, which might have been regarded as vital or physiological, if they had not taken place after death. In the face of these facts it is impossible to have recourse to any pathological cause to account for the origin of the injuries found; and if, notwithstanding the conviction which such facts ought to carry with him, any one would insist on ascribing the appearances to some irritation or other pathological cause acting on the stomachs of all these rabbits, he would still have to explain appearances in distant organs, which from their regular and progressive march and anatomical characters are demonstrably of the same nature with those found in the stomach.

But besides the accidental circumstances, such as the form and position of the organs, which, by favouring the action of liquids issuing from the stomach, enable us to explain the nature of the injuries produced, there are others which also contribute most materially to this explanation. For example an important circumstance is the effect of the simple contact of an organ, without regard to its position. We have seen that the concave surface of the liver on which the stomach rested, was white, softened, and turned into pulp, even in places where complete destruction of the coats of the stomach had not taken place. These changes might be ascribed to the percolation of the liquid matter through the opening in the stomach towards parts more depending in position; but in point of fact the same changes presented themselves in organs which merely touched the *highest part* of the stomach. In like manner in almost all my experiments the intestines which rested on the uppermost part of the stomach were either whitened, or both softened and whitened. These two states were often very

striking ; for on raising for example a turn of intestine, it was seen to have lost its natural colour and become as white as paper wherever it was in contact with the stomach. The two colours which the turn of intestine exhibited were as well separated as if they had been laid on with a brush. Sometimes it was the longitudinal half of the intestine which had undergone the change of colour ; at other times the change existed only in transverse bands where the intestine had formed folds, the prominent edges of the folds being the only parts which were in contact with the stomach. When the intestine was subjected to slight friction, the whitened portion crumbled into fragments or pulp, while the other portions that retained their colour remained between the fingers. The softening of the intestines by contact was sometimes so great, that a mere touch with the back of the scalpel caused a perforation. I have also twice seen a complete perforation of the intestine, once of the jejunal portion, and once of the descending colon. These appearances, which were perfectly identical with those produced in the stomach and other organs, must be attributed to the same cause ; and as they were confined to the parts in contact with the stomach, it is clear that the cause which produced them could not proceed from any other organ. But as the position of the injured intestine in relation to the stomach does not allow us to explain the appearances by imputing them to the fluids of the stomach being conveyed by the influence of gravitation, we must have recourse to the effect of imbibition, a phenomenon as important as it is common. This is a more important fact than may at first view be thought ; for in truth it supplies a simple and satisfactory explanation of softening and perforation of the intestines, at least in the instances where these appearances occur conjunctly with similar appearances in the stomach. It shows that the gelatiniform softening and spontaneous perforation of authors ought not to be always considered as diseased states of the intestines, and even that the cause which produces them may not always reside in themselves, but be derived from another organ. It further proves a circumstance of the greatest moment, that all the appearances which we are at present investigating, whether of the stomach or of other organs, depend immediately on the action of a *fluid* ; since the cause of the appearances is conveyed by imbibition, and it is not necessary that the stomach contain aliment in order to undergo softening or perforation.

The present would be the proper place to examine the state of the liquids and the chemical characters they present, both in the stomach and in the other organs which were found altered in my experiments. But before undertaking this important

branch of the subject, I may notice an alteration I remarked in the blood in all of these experiments. The blood-vessels distributed on the softened parts, and also on every part where imbibition had occurred, no longer presented the red and blue ramifications, which are remarked in the healthy state when they contain venous and arterial blood. They formed brownish, brownish-black, or almost pure black arborescences. In the great sac of the stomach the first colour was most common, while elsewhere, and in proportion as an approach was made to the origin of the vessels, the colour became deeper and deeper,—a circumstance evidently depending on the greater quantity of blood contained in the latter situations. In those parts on the contrary where the liquids could not come in contact with the vessels, or be conveyed to them by imbibition, the vessels preserved their natural colour, and formed a very striking contrast by their redness with the deep tint of the others. This contrast became still more obvious after exposure for some time to the air. The intercostal and diaphragmatic vessels where the great sac of the stomach rested on them, even though still covered by the peritonæum, presented the same coloration, which was confined exactly to the space covered by this portion of the stomach. The same state of the vessels was observed in the chest, and only in those places traversed by the liquids which had passed through the diaphragm. The form of the vessels was unaltered, and their parietes were even entire where the coloration of the blood was complete. In this state the blood seemed less fluid than natural, but it had not separated into clots, or little striated stains, as is observed so frequently and so remarkably in man.

Having now traced all the changes that are produced in the solids and in the blood, I shall next examine the state of the liquid which was always found in the stomach, or which had passed to other injured organs.

As to its quantity, we have already seen that this was always proportioned to the extent of the alterations produced. At the same time it was not necessarily so; for the duration of its action, and other circumstances to be noticed presently, modified its effects. In respect to its chemical nature, this liquid supplies data of much interest, and very directly related to the appearances we are considering. I allude particularly to its acidity and solvent power.

When a softened or perforated stomach is opened, one is immediately struck by the sharp odour which escapes, exactly similar to that given out on opening the stomach of a living animal when its contents are half-digested. Litmus paper immersed in either of these liquids is at once reddened. The degree

of redness, and the rapidity with which it is produced, differ with the state of digestion, or at least with the greater or less fluidity of the alimentary matters; for if the fluid part of them is separated by filtration, the redness is produced immediately. Another circumstance worthy of remark is, that in a perforated stomach I have never found the acidity of the liquid part of its contents greater than in a healthy stomach during digestion. Nevertheless other experiments would lead me to infer that a very strong degree of acidity is required to produce the complete solution of dead animal substances. These experiments have not been varied so much as I could wish; but at all events it is undoubted that the acidity of the gastric juice is as invariable a phenomenon in cases of softening and perforation of the stomach, as during the process of natural digestion in a healthy stomach.

Many physiologists have established the acidity of the gastric juice. Some, such as *Willis*, *Fordyce*, *Hunter*, *Spallanzani* and *Dumas*, consider it an accidental and not invariable property, resulting from certain diseases or certain kinds of food. Others, such as *Tiedemann* and *Gmelin*, and also *Montègre*, consider acidity as the natural state of this fluid. *Dr Prout* has proved that the contents of the stomach are essentially acid during digestion; and *Montègre* had previously proved by numerous experiments that the gastric juice always becomes acid when the process of digestion commences, and has therefore concluded that digestion depends on this acidification.

Whatever truth there may be in the last opinion, since the acidity of the gastric juice was invariable in all my experiments, I could not but look on it as a condition essential, if not even necessary, to the changes in the food and in the organs by which it was always accompanied. The digestion of the food, and the solution of the tissues could depend only on its direct operation,—on its dissolving power; for these effects were never presented without pre-existing acidity, and were produced not only in the organ of digestion, the stomach, but likewise as completely and extensively out of it.

This is the most remarkable chemical property of the gastric juice, and the property to which must be ascribed all the organic injuries of which I have spoken. We have seen what important changes it effects in the blood; and we have seen the whitening, softening, and complete disorganization which it produces in dead organized textures. But the chemical solution which these textures undergo may be established still more satisfactorily by a simple and easy experiment. I procured a quantity of this acid liquid from the stomachs of healthy living animals, and put some of it into the intestines, urinary bladders

and stomachs of dead animals. In every instance softening or perforation took place. The process of perforation may even be observed throughout its gradual progress by killing a healthy rabbit, removing its stomach, and suspending it under a glass jar in such a way that the great sac shall be the lowest part of it. In a few hours, if the temperature is mild, all the changes I have described will be seen to take place in a regular and progressive manner : The most depending part of the coats of the stomach is first whitened ; then it softens and becomes thin ; and at length it is perforated. I have remarked all these changes occur in the course of five or seven hours, at a temperature between 54° and 66° F. ; a temperature much below that of the rabbit at the time of death, which in the region of the stomach is 99° .

It is probable that the action of the gastric juice after death is modified by a great reduction of temperature, yet I have produced perforation of the stomach in several rabbits during winter, when the temperature of the air of the apartment where they were hung up did not exceed 43° or 54° . But the effect even of the lowest temperature which occurs in this country may be counteracted by the various circumstances that contribute to preserve the warmth of the dead body, such as obesity, fullness of the viscera, the clothes, and the particular place where the body is kept. It is unnecessary to observe, that the warmth of the body at the time of death must contribute powerfully to the action of the gastric juice.

I have made other experiments with the view of determining the influence which the particular kind of death and the position of the dead body has in the production of softening and perforation of the stomach.

As to the kind of death, these two changes occur quite as quickly when the rabbits are asphyxiated as when they are killed by a blow on the head. *Adams* remarked perforation in dogs killed by division of the spinal chord, and by a blow on the pit of the stomach ; *Hunter* and *Spallansani* in fishes killed by blows on the lower part of the body. I have also remarked it in rabbits where a considerable hemorrhage from the nose and ears followed a blow on the head, and when the internal iliac artery was lacerated. It is clear, therefore, that in healthy animals the kind of death is not of material consequence. The same may be said of the real and apparent death of *Hunter*, which *Adams* conceived he recognized in the flaccidity of the muscles and fluidity of the blood ; for in my experiments softening and perforation were produced, whether the body passed through the stage of rigidity or not.

But the position in which the animal is left after death has always appeared to me to have a very marked influence in regulating the occurrence of perforation. It will be remembered that destruction of the stomach and other organs was produced to a very great extent in the four experiments related above; and that in these experiments the rabbits were hung up by the hind-legs. When they are suspended by the head, perforation is seldom produced, but merely erosion and softening in various degrees; the same thing happens when they are placed on the belly or right side; when placed on the back or left side perforation occurs more frequently. In every position the injury takes place in the great sac of the stomach. In the first of these positions, it is clear that the blood must accumulate in the system of the vena portæ, because the blood gravitates in that direction from the vertical position of the body, and the intestines press on the liver and the veins proceeding to it. In all my experiments of this kind the veins going to the liver were much distended, and the intestines were collected in a mass upon the liver so as to distend the hypochondria. This accumulation of blood tends to promote perforation, because in my opinion the secretion of gastric juice goes on for some time after death, as *M. Magendie* seems to have proved; and congestion is a condition, if not necessary, at least favourable to every species of secretion. The congestion which is produced in the present case cannot be considered as a mere stagnation of the blood; for the capillary circulation does not cease immediately after death, but goes on for some time, under the influence of the elasticity of the arteries, not to mention the influence of the heart, whose contractions go on after death much longer when the head of the body is in a depending position. Even if there were merely a simple stagnation of the blood, it would still be true that the transpiration and imbibition of fluids accumulated in the capillaries of the stomach must take place much more copiously than in the opposite condition of these vessels.

I was nevertheless desirous of ascertaining by actual experiment if a sufficient quantity of gastric juice is formed after death to produce of itself softening and perforation of the stomach. For this purpose I opened the stomachs of several rabbits immediately after death; and after removing the alimentary contents by a hole near the pylorus, washed them out with water at the temperature of the rabbits' bodies. The apertures in the stomach and abdomen being then closed, I left the carcasses in the usual vertical position for twenty-two hours. In only one instance could I remark any obvious alteration of structure in the stomach. In the great sac there were three small perforations of a circular form, and with thick, whitish edges.

In this, as in all experiments of the same kind, the stomach had contracted and formed numerous folds internally, so that its cavity was very small,—a circumstance which ought to have contributed to impel towards the most depending part of the organ any little gastric juice which might have been secreted after death. It is worthy of being noticed that the mucous membrane was not so much as moistened. In the neighbourhood of the stomach, the liver alone presented here and there an incipient discoloration and softening.

As I was unable to produce perforation again in the same circumstances, and indeed not even softening of the membranes of the stomach, the result obtained in this solitary experiment must be considered equivocal. And indeed the sources of refrigeration of the body are so numerous in experiments of the kind, that it is not easy to draw any inference either on one side or the other of the question which led me to try them.

The weight of the intestines, besides pressing on the vessels, may act directly on the stomach, and by compressing the alimentary matters it contains, may squeeze out the gastric juice which is mixed with them and direct it towards the great sac. This in fact is an imitation of a vital phenomenon in these animals ; for the pyloric portion of the stomach, which has a much greater muscular power than the cardiac end, squeezes the food which is contained in it, and at the same time that it pushes the food forward presses out the liquid with which it is impregnated. The surrounding of the stomach by the intestines may further contribute to its perforation by preserving its heat longer. The intestines being interposed between the stomach and the causes of its refrigeration, and their heat being in relation to their volume much greater in quantity than that of the stomach, it is evident that the temperature of the latter organ will be longer preserved, than if the intestines were collected in the lower part of the belly or spread throughout that cavity.

Here end my experiments on the gastric juice of animals and on its effects on the stomach, blood and viscera subjected to its action after death. They leave, it must be allowed, many blanks to be subsequently filled up. I have merely endeavoured to establish the fundamental facts connected with the subject of my present inquiry, without wishing to determine all the circumstances that may modify the results to which I have been led.

Now that we are enlightened by the direct observation of the phenomena developed after death in healthy animals killed during the act of digestion, we may examine the validity of the explanations which have been successively given by different authors of softening, erosion and perforation of the stomach

Of all the causes which have been assigned, one only can be admitted as the true cause in the instance of rabbits. The only admissible cause of the softening and perforation in them is the gastric juice, in its natural state, such as it exists in a healthy stomach during life. My experiments establish that fact irrefragably. We have seen that softening and perforation were never found without this fluid having been present;—that its acidity, on which its solvent power depends, was exactly the same during life as after death;—and that in the former case it accomplished the digestion of the food, in the latter digestion of the stomach itself.

Is there any necessity, then, to look for the explanation of these appearances to a peculiar modification of the gastric juice brought on by some disorder or another of the nervous system of the stomach? The facts I have related render such a supposition quite inadmissible. The influence of the nervous system cannot be admitted, since the stomach is perforated in healthy animals, whether they are killed by a blow on the head, which may produce some injury of the brain, and so render its influence on the stomach doubtful, or are asphyxiated, or killed by blows on various parts of the body. If it be proved that the solution of the coats of the stomach is to be ascribed solely to the acidity of the gastric juice, and that this acidity is not greater in a stomach which is perforated, than in one which is carrying on the process of digestion, where is there any necessity to seek, in the morbid modifications of an organ, an explanation which is supplied sufficiently by its natural state. It is not difficult to perceive why physiologists have had recourse to the former mode of explanation, and so fallen into error: They were too anxious to explain the appearances in the stomach without having previously acquired an exact knowledge of the properties which its healthy secretions possess, and of their influence on dead organized textures.

Jäger is the author who has chiefly defended the opinion that perforation of the stomach from the action of the gastric juice depends on some modification of the nervous system which has the special effect of producing an increased degree of acidity. But his notion that solution of the stomach cannot take place without this increase of acidity is completely at variance with the results of my experiments. The same author conceives that, besides an excess of acidity, another essential condition is a tendency to softening in the tissues which are found to undergo solution; and *Dr Gairdner* has likewise supported this view of the cause of perforation. But from the facts related above, it is clear that such a state of the tissues can be regarded as a circumstance merely accidental, and by no means necessary

to the explanation of the effects of the gastric juice. The utmost effect which can be justly ascribed to it, is that it renders the changes more rapid, and in some cases more marked.

As to the second order of causes,—irritation is the fundamental condition, the *sine quâ non* which is believed to produce and explain every thing. But unluckily for this doctrine, my experiments were made in the healthy state of the body, and the organic injuries did not appear till after death. The opinion of *Chaussier*, and more particularly that of *Broussais* and his school,—that irritation on the one hand engenders an acrid, erosive liquid capable of destroying the textures of the body, and on the other hand produces of itself all the appearances which have been described,—have been formed from an imperfect observation of facts, which they considered in one point of view only, and therefore did not interpret correctly. It would be difficult to find an example better calculated to show the falsehood of the doctrine of irritation, and its total insufficiency to explain the origin, progress, and specialties of all the organic derangements of the stomach. It was chiefly to put this fact in a clear point that animals in a state of perfect health were chosen for the preceding experiments. And what derangements were found! What destruction of the stomach and of other organs! Softening, erosion, perforation in all their stages: And all produced unequivocally after the death of the animals. I need not hold out any farther fact for the believers in irritation to meditate upon. The genius of Hunter long ago pointed out to them this obstacle, which they turned to ridicule, in order to form a more extensive foundation for a hypothesis, which nevertheless, must with equal certainty fall to the ground.

It only remains for me to add a single word on the third order of causes, from which in the opinion of some pathologists, softening, erosion, and perforation of the stomach may proceed; I mean gangrene and putrefaction. All the reflexions to which we have been led in discussing the preceding causes, apply equally well to these. The presence of gangrene or putrefaction when either of these states accompanies any morbid appearance, is too easily recognized to escape the notice of the most inexperienced pathologist, even supposing that the state of the rabbits on which I experimented had not secured me against any mistake of the kind.

We may therefore establish the following principles as demonstrated by the present inquiry.

1. Softening, erosion, and perforation of the stomach may and do take place after death in healthy animals killed during the

act of digestion. 2. These appearances are owing to the gastric juice, the natural secretion of the stomach. 3. The properties of this fluid in a stomach which has undergone one or other, or all of these changes, do not differ from the properties it possesses in a healthy living stomach during the act of digestion. 4. Acidity is in these two circumstances an invariable and essential property of that fluid ; and solution of the coats of the stomach, like that of the food, is the necessary consequence,—a chemical effect of its acidity. 5. Softening, erosion, and perforation are produced equally in other organs, such as the liver, spleen, intestines, diaphragm, peritonæum, and pleura. 6. In all these cases the gastric juice is the chemical agent which produces the organic injury, its action being regulated by position, gravitation, and imbibition. 7. The effects resulting from the action of the gastric juice show themselves not only in a dead animal body, but likewise as quickly out of the body in dead organs into which it is introduced. 8. All the changes observed in rabbits, whether softening, or erosion, or perforation, are produced after death. 9. The solvent power of the gastric juice cannot be exerted on the living tissues.

Although I have been led by my experiments to reject all the opinions maintained by authors respecting the cause of the organic changes in the stomach which are pointed out in this inquiry, excepting the opinion which considers them the effect of the natural gastric juice, I am far from intending to deny the influence of other causes in certain special instances. On the contrary, I am aware there are morbid states of nutrition more or less similar to these pseudo-morbid appearances, and which arise from certain modifications of innervation and circulation, known by the names of irritation, inflammation, hyperemia, and active congestion. I have witnessed these organic conditions in their effects both on the stomach and on other organs. I know that gangrene sometimes invades these organs, and that putrefaction may alter or destroy them. I have already admitted, at the commencement of my inquiry, the importance of studying all these causes, and believe that an important service will be rendered to science by fixing the anatomical characters of the two orders of organic injuries,—those namely which occur during life and those produced after death. I shall endeavour to supply some information for this purpose by examining in the Second Part of the present paper the effects of the gastric juice on man in the healthy and diseased states, *first*, when death takes place suddenly from an external cause or by an injury of some other organ besides the stomach ; and *secondly*, when death is the result of some acute or chronic disease.

ART. VI.—*Contributions to Pathology and the Practice of Physic.* By Dr HENDERSON, and Messrs GRAHAM, LAW-RANCE, RANKEN, and BODKIN.

I. *CASE of Intestinal Calculus terminating in Perforation.* By ALEXANDER GRAHAM, Esq. Surgeon, Polmont Cottage, Falkirk.—Thomas Brown, aged 21, a miner, of sanguine temperament, had been from his infancy liable to occasional darting pains in his bowels, attended with obstinate constipation and loud rumbling noise, so much so as to have been distinctly heard by his neighbouring workmen at a great distance for several years past. These symptoms, his parents say, were particularly observable after an attack of measles, which he had when four years old. The pains gradually increased in severity, and by last autumn became so violent as to render him unfit for work for several days at a time. About this period he discovered a swelling in the right inguinal region, whence he thought the pains arose. In October, when I first saw him, he was considerably emaciated. The tumour was about the size of a hen's egg, hard, circumscribed, and tender when touched. The abdomen was otherwise soft and free from swelling; the pulse natural; the tongue whitish; the bowels costive; and the urine healthy. Considering it a case of diseased mesenteric glands, local bleeding, blisters and gentle laxatives, with milk diet, were ordered, but without benefit; and as the tumour still increased, and assumed a suppurating appearance, with feverish pulse, fomentations and poultices were applied. Some time in February, deep indistinct fluctuation was perceptible in the part, and I stated to his friends that I thought, by continuing the warm applications, I should be enabled to open the tumour in a few days.

On the night after my visit, however, the pain, which had been for several days dreadfully severe, suddenly ceased, and he was instantly seized with a violent purging of very offensive smell. The stools were found to consist of purulent matter, mixed with streaks of blood. He felt greatly relieved, and the swelling decreased considerably, but retained its hardness. His relief, however, was of short duration; for in less than a fortnight the pain again returned, and the tumour increased in size. By this time the fever had assumed the hectic character, and he was harassed with colliquative diarrhœa. Local depletion, blisters, issues and alteratives were again tried, but without any alleviation of the symptoms. He had occasional days of comparative ease, which were observed to commence after the pains had been for some days constant, with a sudden increase of the purging, and

a feeling as if something had given way within him. From this, and from the nature of the dejections, which were at these times observed to contain more pus than when the pain was constant, it was evident there was a suppurating surface in the gut; but what the tumour consisted of, neither the other medical gentleman who attended him, nor myself, could ascertain. Vomiting and serous effusion into the cavity of the abdomen were now added to the list of fatal symptoms. The pain stretched more to the left side, and the swelling became irregular and less defined. On the morning of 29th May, he was suddenly called to stool, and while up expressed himself as if "his bottom was coming out." When laid down again, he said he felt as if his "belly would burst," and complained of most excruciating pain over the whole abdomen, which suddenly became tense and very tender to the touch. He expired in the greatest agony at 8 o'clock in the evening, being quite sensible to the last. His urine for a few days previous to his death was turbid, and deposited a lateritious sediment. The only medicine which afforded him any relief was opium, which he had used for upwards of two months.

The body was examined 24 hours after death; and I was kindly assisted by my friend, Mr Main of Falkirk.

The abdomen was so much swelled and tense as to prevent any particular tumour or hardness being perceptible when the hand was applied to it. On opening it a great quantity of very foetid air escaped. The peritonæum and small intestines,—except in being of large diameter, and perhaps a little paler than natural,—were of healthy appearance; they were much distended with flatus, and quite empty of fæculent matter. On making an incision from the umbilicus to the anterior spinous process of the right ilium, a considerable quantity of thick purulent matter, of a most offensive smell, escaped from an opening about an inch in diameter, situated on the anterior surface of the colon. There were no adhesions betwixt the intestines and parietes of the abdomen. Carrying the fingers through this aperture, a calculus of a flat square shape, an inch and half long, and half an inch thick, was found lying loose in the gut, surrounded with pus. After this a second and then a third were removed, each of larger dimensions, but of similar figure to the first. Lower down towards the rectum, a fourth calculus, of an irregular roundish shape, about the size of a pretty large potatoe, was found. This was not in contact with the former ones. They were all lying loose, surrounded with pus, without any sac. On their surface were found several oatmeal seeds, which the patient had got in gruel a few hours before death. Having removed all the small intestines, which were floating in serum mixed with pus, we found about twelve inches of the colon in a

very diseased state. The mesocolon was of a purplish colour, and very easily lacerated: the conglobate glands numerous and enlarged. The coats of the gut in this place were much thickened and indurated, the mucous membrane being ulcerated in its whole circumference. At the caput coli the intestine was puckered and contracted so as to admit with difficulty the tip of the little finger. The contracted portion measured an inch deep, and the mucous lining for more than an inch below this was also ulcerated, although the gut here was less indurated and not so thick. The rectum, proceeding downwards, appeared healthy, but of small diameter throughout. We distended the urinary bladder with air, when it was found quite healthy; as were also the kidneys, ureters, and other viscera.

The four stones when weighed the day after they were removed amounted to $5\frac{1}{2}$ oz., but have since lost $2\frac{1}{2}$ oz. The large one measured on each side $2\frac{1}{2}$ inches, being $8\frac{1}{2}$ inches in circumference. It lay close upon the contracted part of the gut, being detached from the others. Both its upper and under surfaces are hollowed out into a cavity, having the appearance as if it had once been perforated. The three small ones were in contact with each other, the middle one having two flat surfaces. The smallest one measured 4 inches in circumference; the next 5, and the third 6 inches. The friends allowed me to take home the whole diseased portion of intestine, which I have preserved. It is laid open, exposing the internal surface till it reaches the contraction, which is finely exhibited; as is likewise the aperture through which the matter escaped into the abdominal cavity, being the immediate cause of death.

One of the concretions was examined by Dr Christison, who found it to consist of the same materials as the most common intestinal calculus in Scotland.* It was composed of several concentric layers, some of which were thick, brown, soft, velvety, and formed of a congeries of small vegetable fibres closely impacted together in the usual manner, while the alternate layers were thin, white, hard, and composed chiefly of phosphate of lime.

II. Case of Fatal obstruction in the Intestines and Inflammation. By S. G. LAWRENCE, Esq. *Surgeon, Royal Military Asylum, Chelsea.*—Edwin Mills, a stout healthy boy, twelve years of age, had been out for a couple of days to see his mother. On his return here in the evening, April 11th, 1830, he drank very copiously of cold pump-water, and went to bed. On the following morning, at nine o'clock, he was brought to

* See Monro's *Morbid Anatomy of the Stomach, Gullet, and Intestines*, 2d Edition.

the Hospital, complaining of violent pain in his belly, particularly at the navel, with constant vomiting, and much general distension of the whole abdomen. Pulse very small and quick; tongue covered with a yellowish fur; bowels confined; countenance expressive of great anxiety and depression. Says he has not eaten of any thing likely to have disagreed with him except a mince pie.

Bleeding, both general and topical, calomel and colocynth pills, glysters, fomentations, warm-bath, blisters, &c. were successively employed without producing any beneficial effect. His pulse rapidly sunk, and soon became imperceptible, the bowels remaining obstructed, and the stomach rejecting every thing he took.

He died in thirty-six hours from the first attack. The symptoms corresponded so exactly with those of strangulated hernia, that it was suspected to be a case of *intus-susception*, two or three fatal cases of that kind having occurred among the children here. The following inspection, however, sufficiently elucidated the cause of his death.

The boy was examined thirty-eight hours after death.

External appearance.—The abdomen was excessively swollen and discoloured, of a dark green colour, with much general lividity of the whole body; and a great quantity of yellowish fluid had escaped from the mouth since death.

Abdomen.—On opening this cavity about eight ounces of bloody serum flowed out. The *small intestines* were seen to be highly vascular, of a pinkish colour, surrounded with numerous red vessels, and enormously distended, partly by flatus, but chiefly with an immense quantity of a turbid yellowish fluid, having a great number of small black currants floating in it. There must have been upwards of three quarts of this fluid in these intestines.

A singular and unusual appearance was now observed in the lower part of the abdomen. An adventitious portion of intestine, in form of a pouch, or *cul-de-sac*, somewhat resembling the finger of a glove, four inches in length, and of a dark purple colour, was seen rising from among the convolutions of the ileum lying above the brim of the pelvis, and firmly attached at its upper or blind extremity by a ligamentous cord, an inch and a-half in length, to the umbilicus.

By tracing the intestines, the pouch was found to originate in the ileum, about fifteen inches from its termination in the cæcum, and this portion of the intestine was much contracted in diameter, of a livid colour, and contained only a very small quantity of bloody serum. It now became evident that the convolutions of intestine which lay between the pouch and the cæcum, had got so compressed and strangulated that the canal

was completely obstructed, for the livid colour commenced abruptly at the place where this pouch originated; and when the parts were *in situ* the ligamentous cord attached to the *umbilicus* was tense, and greatly on the stretch.

The *large intestines* did not exhibit any unusual vascularity. The *cæcum* was not attached by cellular substance to the right *iliacus internus* muscle as usual, but lay quite loose. It was much distended with air, and also the *colon*, both of which likewise contained a large quantity of thick fluid resembling gruel with oil floating in it, and apparently part of the glysters which had been injected. The *sigmoid flexure* of the *colon* and the *rectum* were small and contracted. There were no solid *fæces* throughout the whole intestinal canal.

The *mesenteric vessels* were gorged with blood, particularly those of the lower strangulated portion of the ileum.

The *stomach* was greatly distended with air, and also contained above a pint of the same kind of turbid yellow fluid found in the small intestines, with numerous black currants floating in it. On removing the contents a very slight redness of the internal surface was only observed. All the remaining viscera were in a perfectly healthy state.

Thorax.—The lungs were remarkably healthy; and nothing morbid was here observed.

Remarks.—I am aware that several anatomists have noticed this kind of *lusus* or preternatural pouch, occasionally found in the *intestinum ileum*, and also that it has been seen incarcerated in a hernia. *Littre*, in the "*Mémoires de l'Académie Royale des Sciences, an 1700*," has related this circumstance; but I do not know of any instance on record where it has been found connected with the *umbilicus*, or where it has produced a fatal obstruction while in the cavity of the abdomen.

The immediate cause of the fatal occurrence in the present case, I conceive to be owing to the inordinate distension of the small intestines by a large quantity of fluid and ingesta, which having put the pouch on the stretch, (it being firmly tied to the navel,) had caused it to compress the intestine below it, at the same time that the gorged state of those above, by their weight and pressure, increased the strangulation and obstruction, producing as a natural consequence the fatal inflammation.

About four years ago this boy was attacked with an obstruction in the bowels, which threatened to prove fatal, but it yielded to the usual remedies. It must be considered rather remarkable that he should never but once before, (according to his mother's statement,) have had any serious obstruction; for the attachment of a portion of the intestines to the navel might be supposed to be very likely to interfere with their peristaltic motion, and an

obstruction to be easily produced, whenever the bowels might happen to be overloaded,—no uncommon occurrence among children.

That this pouch and adhesion existed at birth, I think cannot admit of a doubt. It was totally unlike any adhesion from previous inflammation, and the size and strength of the ligamentous cord corroborate this opinion. I transmit herewith a rough sketch of the parts as they appeared *in situ*, and after they were removed and disentangled, which perhaps may give a somewhat better idea of their appearance than a mere verbal description.

May 25th, 1880.

Case of Poisoning from the Bonito, (Scomber pelamis).

By PATRICK B. HENDERSON, M. D. Wick.—The following accident occurred on 17th April 1828, on board the Triton of Leith, while homeward-bound, and in Latitude 4° 10' N. Longitude 19° 48 W.

Five of the crew were taken suddenly ill soon after breakfast. They complained of violent headach and throbbing, as if, to use their own expression, “their heads would burst.” The eyes were bloodshot; the vessels very large and distinct; the eyeballs full and watery. The face was swollen and flushed; the whole body much swollen, and remarkably red, and felt to the patient as if much larger and fuller than natural. Shivering, or rather trembling over the whole body, accompanied these symptoms.

One or two only of the patients suffered under all these symptoms; the others were not so severely affected. Another of the crew had partaken of the fish along with these, but having become sick and vomited immediately, he suffered no inconvenience.

On using the lancet in the two worst cases, the blood sprung from the wound with unusual force. The blood was thin and pale; it did not coagulate in the usual manner, nor did it show the common indications of inflammation. An emetic was given to three of the patients, on two of whom it operated freely, on the other only partially. Full doses of the compound powder of jalap were given to all the patients, but did not operate in three of them.

In the evening all the patients were better; headach going off; redness and swelling of the face, body, and limbs also retiring. On the 18th they were all well and on duty.

That these individuals suffered from eating the Bonito, is evident from the facts that only those who partook of it were affected, and those who eat most were worst.—A French boy in the cabin was taken ill at the same time, and with the same

symptoms in a mild form, and it turned out that he had eat a small bit of the fish along with the men.

For a number of days previous to the occurrence of these cases, every one in the ship had partaken freely of the Bonito, without suffering the slightest inconvenience. But the fish used by the men in this instance, had lain exposed all night on the top of the galley, under a heavy dew, and while the moon was up. It is probable that this may account for the effects produced.

It may be observed in conclusion, that the headach went off sooner in the case where bleeding was employed than in the others; and this was not followed by a similar result in another, where an emetic was given after bleeding. But this was the worst case of the whole, the patient having taken the largest share of the fish; and the emetic did not act freely.

Wick, 24th June 1830.

Case of Epilepsy, with the Epileptic Aura and loss of the power of distinguishing colours, produced by a blow on the head. By H. L. RANKEN, Esq. Surgeon, Ayr.—William M'Harg, æt. 10, fell while running, and struck the back part of his head against a projecting stone in a wall. He fell and lay motionless for about three quarters of an hour, until I saw him. I found him still breathing, with weak and slow pulse; pupil insensible to light, and dilated, I bled him immediately, when he gradually recovered, becoming more and more sensible as the blood flowed. When I was binding up his arm he fell into a violent convulsion. I therefore untied the arm and allowed the blood again to flow. He became faintish, when I bound up his arm again. I left him quite sensible, and complaining of violent pain on the back part of his head, which exhibited a contused wound, the effect of the blow.

April 10th, I found him complaining much of pain generally through his head, and learned that he had had several convulsions during the night. He was therefore bled to viij. oz. I was called again at night with a message that he was dying; and found him in a convulsion with clenched teeth, fixed eyes, and such powerful action of the muscles, that two men could scarce restrain him. Pulse 100. I bled him again, and left him relieved.

April 11th, Fever and pulse much reduced. Better.

April 12th, Convulsions still recurring. But better upon the whole.

13th, Much the same. No fever.

14th, Convulsions have taken the form and appearance of epilepsy, the epileptic aura being very distinctly marked,

sometimes coming on at his toe and sometimes in one of his arms. He was directed to take six grains of assafoetida in two tea-spoonfuls of spirits whenever the fit recurred.

15th, The assafoetida stopped the fits, and, upon every recurrence of them it was repeated, generally with the effect of stopping, and at least of lessening the violence of them. The patient remained in this state for about three weeks, the pain still continuing violent on the back part of his head, so much so that his mother could not get a nightcap put on. On examination nothing could be perceived, the bruise of the integuments being healed, and the skull presenting a perfect equality of surface,—that is, as much so as is natural,—for the seat of the injury was just upon the tuberosity of the occiput.

I should have mentioned that the faculty of distinguishing colours was lost, and still continues so. At last, on the 12th May, about a month from the time of the accident, he discharged a quantity of pus from his nostrils, and ever since has been free of convulsions, and in very good health.

I have no doubt there had been formation of pus beneath the occipital bone, but the wonderful thing is the way in which nature rid herself of it. The event of the case would make it appear that in all probability the fits were owing first to effusion of blood, and latterly to matter irritating the cerebellum; and consequently, the assafoetida could have had little effect. The case, however, is reported as it happened, without any attempt to reconcile cause and effect, or explain the phenomena of the case.

June 1st, 1830.

Case of recovery from extensive Injury of the Left Hemisphere of the Brain. By THOMAS BODKIN, Esq. Surgeon, Tuam, Member of the Royal College of Surgeons, &c.—William Connolly, aged 30, a blacksmith, on the evening of January 27, 1830, was firing at a mark with an old musket heavily loaded. The explosion retrograded, and shot the screw part of the breech deeply into his brain, an inch above the superciliary ridge on the left side. The whole of the breech, including the neck, was sunk beneath the surface, except the tail-part, which projected nearly at right angles from the forehead, with the screw-hole in its extremity, by which the breech is fastened to the stock by a screw-pin; and through this hole it was necessary to pass the same screw-pin, to facilitate the extraction of the breech. This required a degree of force equivalent to what is sometimes found necessary in drawing a tight wine-cork. Very shortly after the accident, I accompanied the Rev. Mr Duffy of this town to see him. He was then lying on a bed; the breech had been removed as I described; his face was scorched black; his eyelids swollen and clos-

320 Mr Bodkin's *Case of recovery from extensive injury*

ed ; his extremities cold ; pulse 50 ; he was collected, and very capable of muscular exertion, volunteering to sit up for my convenience while I examined him. A wound with uneven, swelled, and lacerated edges extended an inch and a half in length, and an inch above and parallel with the eyebrow. I removed several comminuted fragments of bone with great caution, as the least inadvertent pressure sank them deeper in the broken pulp of brain, in which they were imbedded. On passing the point of the fore-finger round the inner edge of the aperture, several pieces of the inner table were found loosened. These were also removed with some necessary force between the point of the finger and the end of a probe. Being now satisfied of the firmness of the edge which bounded the aperture through the bone, and which was nearly oval and better than an inch in diameter, the external wound was with much difficulty, and only partly, closed with narrow straps of adhesive plaster. A bit of simple dressing was laid along the line of the opening, and over all was applied a pledget of wetted lint. About a dessert spoonful of brain escaped during the dressing. I should have observed that the membranes of the brain were quite destroyed to the extent of the opening in the bone. When I left him for the night, his pulse was 56. The bowels had been open during the day. No medicine was ordered, but perfect quietude and silence were strictly enjoined.

28th, Slept quietly ; no pain ; bowels open ; pulse 60 ; tongue a little whitish ; feels much annoyed from the quantity of discharge streaming down his neck and shoulder. It was a bloody serum mixed with a great quantity of brain floating through it. The same dressing was continued, and he was enjoined low diet ; but no medicine was ordered.

29th, Passed a quiet night ; bowels not open ; general appearance heavy and apathetic ; frequent sighing ; tongue white and furred, with a black streak in the centre ; pulse 60. Continue the dressings.

R *Submuriatis Hydrargyri, gr. viij. Pulveris Jacobi gr. v. Elect Scammonii, gr. xx. M. fiat Bolus nocte sumendus.*

30th, Brain still issuing in considerable quantity, mixed with serous blood and pus, in which bits of membrane and of the cortical substance might be distinguished ; tongue white and furred ; pulse 60 ; bowels open ; still heaviness and apathy of expression. 31st, Pulse 65, small ; tongue still furred and white ; wound erysipelatous round the edges ; frothy discharge, mixed with brain ; bowels open.

February 1st, Some slight mental aberration ; incorrect me-

mory as to time ; silliness in his talk ; bowels not open. *Repetatur bolus.* Dressing as usual.

2d, Pulse and tongue as usual ; bowels open. I found great difficulty, as from the beginning, in approximating the lips of the wound, on account of the strong pulsatory bulging of the brain. Mind more collected, but excessively irritable and petulant. Continue the dressings.

3d, He feels in better spirits, and confident of recovering. With very great difficulty the edges of the wound are forced together. *Repetatur bolus.*

4th, The discharge of brain is becoming less, and the centre of the wound seems coagulating into something like a fungous consistence. The surface of it when cut close to its base with curved scissors presented a diffused vermilion streak, which appeared to be composed of minute red points, lost in a surrounding cream-coloured edge. These little red points were probably the cut mouths of newly formed vessels commencing in the organization of a *fungus cerebri*. The whole surface and circumference of the wound were now freely touched with the lunar caustic ; and a strip of dry lint was interposed between the wound and adhesive plaster to-day for the first time. He complains of some little intolerance of light, and slight pain in the back of the head.

5th, Pain in the head gone ; less intolerance of light ; bowels open ; pulse 64. The fungus looks firmer and contracted ; it was again clipped and touched with the caustic. Dressings as usual. A small bladder of cold water was laid over the dressings and secured with a broad ribbon passed round the head. This was substituted for the wet pledgets, which were found to produce excoriation and tenderness.

6th, The fungus begins to adhere to the edges of the wound ; it was clipped as usual ; and to it and the wound generally the nitrate of silver was applied. The inferior commissure of the wound next the temple, which had been hitherto flabby, irritable, erysipelatous, and excessively painful on the slightest touch, is now free from soreness, contracting and healthy in its appearance, which in my opinion is solely attributable to the free touching with the lunar caustic.

7th, Some uneasiness in the head, which he attributes to his bowels not being open ; expresses much comfort from the bladder of cold water, which is renewed every fourth or fifth hour. *Repetatur bolus.*

8th, Bolus neglected ; bowels not open ; he is childishly irritable, complaining of the most cruel infliction while the wound is dressed.

9th, Bowels open ; temper ridiculously irritable ; upbraids

322 Mr Bodkin's Case of recovery from injury of the Brain.

me with unfeeling indifference to the alleged pain I inflict on him in dressing, yet, as if accidentally, bears without a murmur the most painful part of the process, that of forcibly drawing together the lips of the wound.

11th, My absence from home prevented me dressing him yesterday. He is, however, not worse; feels ashamed of his former unreasonable impatience; now co-operates in handing the plaster, sponge, &c., and putting himself in a convenient position. From this period his recovery was rapidly progressive. As I found great difficulty in closing the wound with the straps, on account of the inversion of its lips over the edges of the bone, I had recourse to the insertion of a single point of suture in the centre. This trifling operation nearly produced fainting, and on the removal of the ligature on the third day, a complete syncope took place. It is remarkable, however, that although no immediate union took place at this point of its insertion, it was very soon the first part skinned over, so that the wound presented for many days subsequently the appearance of two long ovals united at their narrowest parts.

In offering this case to the profession, I merely wish to follow up the intentions of Mr Maunsel, detailed in the publication of his interesting case of Injury of both Hemispheres of the Brain, in a preceding Number of this Journal, by contributing materials for prognosis in injuries of this organ, and giving additional proof how much the brain can bear under peculiar circumstances. Some modifications in the local or constitutional management of the case may not be unworthy of notice. The total want of the necessity for blood-letting is confirmatory of Mr Maunsel's observation as to the uninflam-matory diathesis of the peasantry of this country. The antiphlogistic agency of mercury is strikingly corroborated in both cases. The touching of the wound with the nitrate of silver I found a powerful agent in expediting the healing process, in checking the growing *fungus cerebri*, and in removing erysipelatous tenderness. I may farther beg to suggest, as a preferable substitute for wet pledgets, for the reasons detailed in the history of the case, the employment of a small bladder of cold water. It communicates the most grateful coolness, and, when secured by the moderate pressure of a broad bandage, it spreads over a considerable extent, and assists, by its moderate and accommodating pressure, to secure the dressings.

In the seat of the injury there is a pulsating depression, in which the point of the finger might be placed, and where moderate pressure produces no inconvenience. The man's intellects seem to be sound, and he has worked both at his trade as horse-shoer since February 26th, which requires necessarily

the head to be frequently in a dependant position, and at laborious agricultural work, without any inconvenience.

Tuam, February 30, 1830.

ART. VII.—*Case of Lithic Acid Urinary Calculus successfully removed by Lithotrity at the Greenwich Hospital.* By R. DOBSON, M. D., Surgeon to Greenwich Hospital.

SAMUEL GUDGE, aged 54, a pensioner of Greenwich Hospital, came under my care for gonorrhœa. After having been treated in the usual manner for the space of fifteen days, I began to suspect that his complaint was not simply gonorrhœa; and on introducing a sound, discovered a large calculus in the bladder, the existence of which the patient would not believe, as he had never suffered the slightest symptom of stone, or felt the least inconvenience from it. This arose, as I conceive, from its being lodged in a *sacculus* of the bladder corresponding to its size, immediately behind the prostate gland. To this inference I was led, from the fact of its not being felt when the man was sounded standing; whereas on placing him in a horizontal position, it fell to the fundus of the bladder, and could be then distinctly recognized. The patient being unwilling to submit to the operation of lithotomy, I proposed to him that of lithotrity, with the view of putting that operation to the test, having seen the instruments of Baron Heurteloup, and being satisfied that they were calculated to perform all that the Baron promised. The man having given his consent, I requested the Baron to visit and sound him, which he did, and willingly undertook to operate on him gratuitously, Sir Richard Keats, the governor of the hospital, with the laudable view of promoting science, and lessening human suffering, having kindly sanctioned the operation. Preparatory to the Baron's coming down, I dilated with a bistoury the lips of the urethra, which were rather contracted at the superior angle; and ultimately I passed a straight bougie, No. 19, directly into the bladder.

On the 10th May, the rectum having been previously emptied by an enema, the Baron proceeded to the operation. Having injected the bladder full of warm water, he introduced his instrument with four branches, and soon succeeded in grasping the stone, which he drilled and excavated, the patient suffering no other annoyance than a desire to void his urine during the operation. After the Baron had withdrawn the instrument, the urine the patient passed was slightly tinged with blood, and much sand or ground stone came away,

but no more blood after the first time.—11th, The patient feels well, but complains of some smarting in making water, which still contains sand.—14th, Urine turbid, but contains no sand.—15th, Sounded him; the stone feels rough, and seems to be placed with the long axis from side to side. He complains of some pain in the lumbar region. The quantity of detritus collected from the first drilling was 30 grains.

On the 3d June, the Baron repeated the drilling, and perforation with a larger instrument, but which had only three branches. The process occupied about a quarter of an hour. A considerable quantity of sand came away in the urine, but no blood.—4th, Sounded, but found the stone not broken. The quantity of detritus collected since the last operation amounted to 45 grains.

On the 10th, the Baron repeated the operation, but found more difficulty in introducing the instrument, on account of the urethra being rather swollen, as he supposed, from the former operation. He grasped the stone without difficulty; but to perforate it was not so easy, on account of its extreme hardness, which was so great as to resist the virgule or excavator. In taking another presentation of the stone, one of the claws of the instrument got into a former perforation, and it occupied the Baron several minutes before he could get rid of the stone. After this, when he emptied the bladder, some coagulum passed, but water injected immediately came away quite clear.—11th, Urine clear; but some soreness and scalding.—12th, Some hard dark pieces of calculus continued to come away. I sounded him, and found some pieces of calculus in the urethra, but the stone still continues large. The quantity of detritus collected since the last operation, amounted to 122 grains.

On the 25th, he had rigors succeeded by perspiration. I passed a large sound with great ease. He complains of his water scalding him, and it has an offensive smell. The stone feels rougher than at first, and seems to descend more closely to the neck of the bladder.

The Baron came down to-day with the intention of operating, but deferred it in consequence of the man's indisposition.

On the 30th, the Baron operated with an instrument which seizes the stone with three claws pointed inwards at almost a right angle, and when thus held, he strikes the stone with a central rod, by which the claws reduce the size of the stone externally. The Baron found considerable difficulty in getting rid of the stone from the instrument, in consequence of it, or some portion of it, having got between the central rod and one of the claws. The patient evacuated several pieces of

the exterior part of the stone with the water, immediately after the instrument was withdrawn.

On the 1st July, he passed a large quantity of laminated fragments of the calculus, and complains of the stone feeling very sharp, particularly after making water. The quantity of detritus collected amounted to 34 grains.

On the 7th, the Baron drilled the stone in several places, and used the hammer once. The man complained of more pain than on former occasions. After the instrument was withdrawn several large and small fragments came away.—8th, Complains of numbness about the pubis.—11th, Complains of some uneasiness in the perinæum, and wished the large sound to be introduced, which passed without difficulty.—13th, Mr Hume having analyzed the fragments of the calculus, reported it to be lithic acid, and animal matter mixed with it. The quantity of detritus collected amounted to 34 grains.

On the 14th, the Baron operated, but did not seem to perforate the stone so much as usual. He hammered the central rod to reduce the stone exteriorly. The process was rendered more tedious and painful than usual, in consequence of some fragments mixed with fibrine getting entangled in the claws, and preventing their being perfectly closed when withdrawn.—15th, A large piece of calculus weighing ten grains was extracted from the urethra by the forceps, several smaller fragments being also spontaneously discharged.

On the 18th, he passed a large fragment, in which five laminæ were distinctly seen, dark and light-coloured alternately.

On the 20th, a small piece of stone, which was sticking in the urethra, came away by injecting the bladder full of water by the stomach-pump, fitted with a catheter. I afterwards introduced a large sound. The quantity of detritus collected amounted to 50 grains. At 2 p. m. the Baron operated with a smaller three-branched instrument, which he preferred, in consequence of the difficulty he found the last time. He perforated the stone with it in several places. The quantity of detritus collected amounted to 34 grains.

On the 27th, the Baron operated, but on this occasion he operated with the brisecoque, instead of the *trois-branches* instrument; and I observed that with this instrument he seized the stone with more facility, and gave the patient less pain than with the others, though little pain was produced by either. The detritus collected amounted to 24 grains.

On the 5th August, the Baron repeated the use of the brisecoque, with which he twice seized the stone without difficulty, and gave the patient little or no pain. Some detritus came away with the water, when the instrument was withdrawn,

and the bladder was subsequently washed out with warm water. In the two last operations no blood was discharged.—10th, No detritus in the urine; a small portion of stone remains in the bladder, which I felt after having injected it full of warm water.—14th, The bladder still contains a little piece of calculus, which is too small to communicate the usual feeling to the hand by the sound, though it can be distinctly heard. Some small fragments came away with the urine after sounding, though none had passed for the last five days.—16th, This forenoon, a fragment of the stone having lodged in the urethra, I removed it by the forceps. At 2 p. m. the Baron came prepared to use the brise-coque, but, having injected the bladder, could not find the least particle of stone remaining. There is reason to believe, therefore, that the fragment which came away this morning was the small piece I heard yesterday.—17th, The urine clear, and the patient quite well; the quantity of detritus collected 49 grains.

The above operations were witnessed at different times by about fifty medical gentlemen, all of whom spoke in the highest terms of admiration at the adroitness with which the Baron used his different instruments; and many were greatly surprised at the facility with which he introduced a straight instrument (so large as No. 18) into the bladder. The time that elapsed between the operations might have been much abridged. But I was apprehensive of exciting inflammation by too early repetition, and therefore suffered several days to elapse, in which the patient made no complaint, before I sent for the Baron, who never followed his own inclination as to time, but always very politely came when requested. That the size of the stone in this man's case was very considerable, is proved, as well by some of the laminated fragments which are segments of a large oval, as from the quantity of detritus which we have collected, amounting to seven drachms, (which may be seen at the Infirmary of the Greenwich Hospital,) independent of much more which must have escaped at different times when the patient went to stool. Since the last portion of stone was extracted, ten days have elapsed, and the man is in the enjoyment of good health.

As the above case affords a proof of the success of an operation which is nearly new in this country, I consider it may be advantageous to the profession, and the community at large, to give it publicity.

24th August 1830.

NOTE BY THE EDITORS.

We have received from Dr Stokes and Mr Harty a request, that, as they had been anticipated in the publication of their paper by the prior publication of the paper of Dr Corrigan, who has taken almost exactly the same view as they have done, of the relation which the several sounds and impulses of the heart bear to its actions,—their paper on this subject might be suppressed for the present. Their note, however, did not reach us till it became impossible to act according to their wishes, without very great inconvenience ; and the Editors have therefore been compelled to allow the paper to stand, as the authors originally intended. The interest attached to the subject of it will, undoubtedly, render their paper deserving of publication in the eyes of the reader, even although he should consider their results as merely a confirmation of a discovery.

The Editors have also to acknowledge the receipt of a list of *Errata* from Dr Carswell in his paper as published in the *Journal Hebdomadaire*, with a request that they might be corrected in the translation. His note was not received till the part of his paper contained in the present Number was entirely printed off. But the only one of the *errata* he has supplied which is not corrected in the translation is the following.—For “ The former depend on certain modifications of nutrition, *or an unnatural* secretion from the stomach,” [P. 284, l. 8,] read “ The former depend on certain modifications of nutrition, —*or on a natural* secretion from the stomach.”—To this we beg also to add, for *Esq.* read M. D. in the title, and for *Mr.* Dr in the running title throughout.

PART II.

CRITICAL ANALYSIS.

- ART. I.—1. *Des Fièvres Puerpérales observées à la Maternité de Paris, pendant l'année, 1829, &c. &c.*—*On the Puerperal Fevers observed at the Lying-in Hospital of Paris, during the year 1829; and on the various methods of treatment employed, particularly mercury, emetics, and blood-letting.* By M. TONNELLE, late Elève Interne of the Parisian Hospitals. Four papers in the Archives Générales de Médecine for March, April, May, and June 1830. Pp. 148.
2. *Résumé de la Clinique Médicale, &c.*—*Account of the Course of Clinical Medicine in the Lying-in Hospital of Paris, for the January Quarter of 1830.* By A. DUPLAY, Elève Interne. Paper in the Journal Hebdomadaire de Médecine, 29 Mai 1830. Pp. 17.
3. *De la Phlébite Utérine, &c.* *On Inflammation of the Uterine Veins and of the Veins generally, considered chiefly in respect to its causes and its complications.* By M. DANCE, Associate of the Faculty of Medicine of Paris. Three Papers in the Archives Générales de Médecine for December 1828, and January and February 1829. Pp. 140.
4. *Mémoire sur le Rammollissement, &c.*—*An Essay on Softening of the Uterus.* By S. G. LUKOTH, M. D. In Répertoire Générale d'Anatomie Pathologique, 1828, I. 1.

NOTWITHSTANDING all that has been written on the pathology and treatment of puerperal fever, the information hitherto collected on these subjects is by no means so complete, but that ample room remains for farther improvement. We believe most intelligent accoucheurs, as well as pathologists generally, are now agreed that the disease usually termed puerperal fever, when it is not typhus or synchus occurring

fortuitously during the puerperal state, is essentially an inflammatory disorder of the uterus, its appendages or the general peritonæum. This is clearly shown by some late publications, and especially by the reports published a few years ago in this Journal, relative to a dreadful epidemic which prevailed in the Obstetric Institution of Vienna in the year 1819. (*See volume xvii. 83.*) There remain, however, many particulars relative to this disease, as to which the minds of practitioners are far from being made up; and especially there is room for a more accurate and minute examination of its pathological anatomy, as well as for a more satisfactory view of the respective merits of the various contrary methods which have been proposed for its treatment.

It was only at a great public establishment, where an epidemic can be observed on an extensive scale, that the objects now mentioned were likely to be attained. Unhappily an opportunity of the kind was not slow to present itself. Paris was lately visited by a puerperal fever of much greater violence than any previous epidemic that has been recorded by French authors, and equal in violence to any that has appeared of late years in other great cities, not even excepting the fatal epidemic of Vienna in 1819. It is unnecessary to say that the opportunity thus presented of studying the disease has been taken advantage of with activity and perseverance; and the result has been the dissertations of which it is our present purpose to give some account. Two of these, the reports of *M. Tonnelle* and *M. Duplay*, are written by the pupils of the late Professor Desormeaux, physician to the Lying-in Hospital and professor of midwifery, who is understood to have collected extensive materials for an express work on Puerperal Fever, but who nevertheless, like most of the medical officers of the Parisian hospitals, laudably encouraged his pupils to make public the practical researches they conducted under his eye and with his instructions. The third paper, of which incidental notice will also be taken, is the work of *M. Dance*, who has the merit of being one of the first that turned the attention of the profession to the important part performed by inflammation of the veins in cases of puerperal fever and uterine inflammation. His observations were made chiefly at the Hotel-Dieu.

Among these dissertations the most important and most detailed is that of *M. Tonnelle*; and therefore we shall in the following analysis pursue the arrangement which this author has adopted. He sets out with dividing his essay into three parts, the first of which treats of the anatomical alterations found in the various organs of the body after death, the second of the

symptoms of the disease in its different degrees or forms, and the third of the treatment.

Before proceeding, however, to discuss each of these subjects, he has judged it necessary to say a few words on the *Causes of Puerperal Fever*, and more particularly the causes of its late prevalence in the epidemic form at Paris. But he has brought forward nothing on this mysterious point which calls for particular notice. He discards the influence of cold as a cause of its prevalence; for although in January, which was a very cold dry month, puerperal fever was extremely common; in December, which was characterized by weather of precisely the same nature, the disease was scarcely to be seen at all. The influence of moisture appeared equally uncertain. For while cases were very numerous during summer, which was a season of unusual cold and rain, they were rare at other periods when the weather was the same; and on the other hand they were extremely common during spring, when the drought was very unusual in degree and duration. In short, the disease prevailed in its greatest degree during cold dry weather, during dry temperate weather, and during moist temperate weather; and at other seasons of the year the same kinds of weather prevailed without the disease being rendered more frequent than usual.

Neither could he trace any connexion between its frequency and a vitiated state of the atmosphere of the hospital. The simple circumstance that it raged in the most irregular manner possible in respect to time,—prevailing extensively this week or month, disappearing the next, and reappearing in a few days,—is sufficient to prove that the cause of its production cannot be sought for in the state of the air of the hospital. As little was it connected with severity of labour, or with previous diseases or bad constitution. And as for contagion,—this cause, to which so much importance is attached by many accoucheurs in Britain, was, he thinks, clearly out of the question in the Lying-in Hospital at Paris; for the women who are newly delivered have each a separate apartment, and yet caught the disease there; while in the sick-ward of the Hospital, where patients with every species of disease are collected, no instance of the propagation of puerperal fever ever occurred.

M. Tonnellé has inadvertently omitted an account of the extent of the epidemic tendency to puerperal fever during the period comprehended in his report. The report of *M. Duplay*, however, supplies accurate information on this point for the months of January, February, and March, immediately subsequent to the period described by his predecessor. During these three months 750 females were delivered in the hospital; and

of these, 146 or about one-fifth part, were attacked with peritonitis, inflammation of the uterus, or both together.

To these observations we may add, as connected with the inquiry into the causes of the epidemic, the following brief sketch from the paper of *M. Duplay*, describing the locality, plan, and internal economy of the Lying-in Hospital. The Hospital of Maternity, as it is called, is situated on rather high ground, not far from the Observatory, which every one who has visited Paris must know is in one of the most open districts of the city,—the houses in the neighbourhood being few, the gardens numerous and large, and the southern barriers at a moderate distance. The sleeping apartments hold most of them twenty, one of them seventy-five beds, and the total accommodation is for 180 patients; but in winter the number sometimes amounts to 230. The patients are admitted for the most part in the middle of the eighth month; but many do not enter till a month later. Till labour commences they are employed in the laundry and kitchen, or as assistants to the housemaids; those who do not wish to work have ample space for walking; and in winter there is a large, well-heated, but it appears not well-aired, hall, where they assemble to work. Their diet is much better than the greater number of them are accustomed to out of the Hospital. When labour commences the patient is taken to the lying-in ward, which contains twelve beds; and here she is constantly attended by a corps of five pupil-midwives, with an experienced pupil at their head; and the mistress-midwife, as well as the surgeon of the house, is at hand when any thing occurs out of the usual course. The ward is supplied with abundance of warm-linen, fixed warm-baths in constant readiness, and all other appliances. After delivery the patient is carried by nurses to the sleeping-ward for the newly-delivered, which is a long gallery divided by compartments into a series of small rooms, each having a single bed. There she is visited twice a-day by the mistress-midwife, and whenever any unusual symptom appears, however slight, the physician is summoned, who directs her removal to the sick-ward if her illness appears likely to prove a smart one.

The whole medical service of the hospital is confessedly one of the most complete in Europe. The chief objections to the internal arrangements are the removal of the patients after delivery through long passages to their sleeping apartments,—the smallness of these apartments, which consequently must either be ill ventilated, or expose the patients to cold currents,—and we may add the bad construction of the necessaries, which it seems also expose the women to dangerous draughts of cold air. But these defects are on the point of being remedied.

Altogether, we conceive it is impossible to discover any thing in the circumstances of the hospital which ought to subject it to epidemic diseases; on the contrary, almost every condition exists on which the physician would be inclined to rely for excluding or circumscribing their operation.

These few remarks being premised, we proceed to accompany *M. Tonnellé* in his exposition of the *Morbid Appearances* found in the various organs of the body. His statements are drawn from the observation of no fewer than 222 dissections. They are completely confirmed in every material respect by the ulterior observations of *M. Duplay* founded on upwards of forty inspections.

We shall first take notice of the appearances which seem to have been more or less essential to the disease, namely, the signs of inflammation in the uterus, its appendages, and the general peritonæum. A few words will then be added on the secondary or subsidiary appearances, which were chiefly the signs of inflammation in the pleura, lungs, heart, muscles, and joints.

Of the 222 cases examined by *M. Tonnellé*, there were 193 in which traces of peritonitis appeared. In twenty-nine cases, then, or about an eighth part of the whole, there was no apparent affection of this membrane. This occurred chiefly where death took place with great rapidity; and in almost all instances of the kind there was disease in the uterus, or its appendages, or its blood-vessels. The slightest visible sign, if indeed an unequivocal sign of peritonæal inflammation, was a clear yellowish or reddish serum effused in small quantity into the general cavity of the belly. A more frequent appearance was bright redness of the intestinal convolutions, with slight connexion of them with one another by means of a loose thin fibrinous effusion. And a still more common appearance was an extensive effusion of a thick serum rendered turbid by fibrinous flakes, or of a more homogeneous yellow fluid undistinguishable from the purulent matter of an external phlegmon. This peritonæal inflammation was sometimes general, more commonly limited to the hypogastrium and neighbourhood of the uterus, and occasionally it affected several detached parts, such as the liver, mesentery, and omentum. The pseudo-membrane formed over the peritonæum sometimes covered extensive brown patches, which some pathologists have mistaken for gangrene, but which arose merely from extravasation of blood.

The alterations of structure observed in the uterus were much more worthy of notice. They occurred in 197 cases, or nine-tenths of the whole. They were of three kinds,—simple inflammation of the uterus and its appendages,—inflammation of

the uterine veins and lymphatics,—and softening or putrescence of the uterine parietes.

Simple inflammation affected sometimes the internal surface of the uterus, sometimes its outer peritonæal membrane, sometimes its substance, and occasionally was perceptible in all these quarters. It occurred in seventy-nine of the 222 cases. The inner surface of the uterus was almost always covered with a reddish-brown, fetid, putrilaginous fluid, the origin of which in inflammation was questionable, as it occurred sometimes in females who did not die of puerperal fever. Frequently, however, it was mingled with disseminated masses of concrete pus; occasionally the inner surface was chequered with an appearance like aphthous crusts; and at other times there was a uniform layer of thick, yellow, concrete pus or lymph, which sufficiently accounted for a symptom to be presently noticed,—the suppression of the lochial discharge. The external or peritonæal surface of the uterus often presented the appearance of little elevations or blisters of the peritonæal membrane, filled with sero-purulent or true purulent fluid; and sometimes the membrane of the vesicles had in many places burst. Inflammation of the tissue of the uterine parietes was very rare, independently of the softening or putrescence which will presently be mentioned: Injection or redness was never found; and pus was found seldom and only in the neighbourhood of the cervix uteri, where the fibres are looser than elsewhere. The apparent purulent deposits or abscesses that were frequently found in other parts of the parietes were in reality collections of pus in the veins or lymphatics. The uterine appendages, however, were often affected with simple inflammation. The broad ligaments often contained pus in their substance; the same fluid was also frequently found in the canals of the Fallopian tubes; and in no fewer than 62 cases the ovaries were obviously inflamed,—being sometimes red and injected merely, sometimes infiltrated with serum, enlarged and softened, sometimes infiltrated with purulent matter, enormously distended, and extremely brittle, sometimes swelled out into one great purulent cyst, which in one instance had burst into the rectum, and in another into the peritonæal cavity.

The next appearance worthy of remark in the organs of generation was *Inflammation of the Veins and Lymphatics of the Uterus and its Appendages*. Within these few years various pathologists have had occasion to observe inflammation of the veins of the uterus and abdomen after death in childbed. *Clark, Wilson, Schwilgué, Chaussier, Ribes, and Breschet*, are each referred to by M. Dance as having met with and published cases of the kind, and since Dance wrote, Mr Arnott and

Dr Lee have contributed observations of the same nature. But it is to *M. Dance* that the honour is due of having first made an extensive and connected set of inquiries on the subject, and of having traced, first in his Inaugural Dissertation in 1826, and afterwards in the series of papers quoted at the head of this article, the close relation that subsists between inflammation of the uterine veins and the typhoid symptoms which are conceived by some to characterize the true puerperal fever, but which in reality merely characterize its worst forms. Those therefore who wish to acquire a thorough knowledge of the admirable researches lately made on this important subject in France, must not fail to peruse the papers of *M. Dance*. But for the purpose of this analysis it will be more convenient to follow chiefly his successor, *M. Tonnellé*, who has not only confirmed every important feature in the observations of *M. Dance* by researches of much greater extent and variety, but has likewise brought prominently forward, what appears to have escaped that gentleman's notice,—inflammation of the uterine lymphatics as another common pathological appearance in cases of puerperal fever. *M. Tonnellé's* results are amply confirmed by the observations of *M. Duplay*, who even infers from his experience that inflammation of the lymphatics is much more common than that of the veins.

Inflammation of the Veins or Lymphatics occurred in 110 of *M. Tonnellé's* cases, that of the veins in ninety of the 110, and that of the lymphatics in forty. *M. Duplay* met with eighteen cases of inflamed lymphatics alone, four of inflamed veins only, and three where both orders of vessels were affected. In eight of *M. Tonnellé's* 110 cases the inflammation of the veins was unaccompanied by any other morbid appearance; in two the inflammation of the lymphatics existed alone; in twenty there was inflammation of both orders of vessels; and in the remaining eighty cases there was united inflammation of the uterus or peritonæum, or softening of the uterus.—The *Inflammation of the veins* appears from the researches of *M. Dance* to commence commonly in the torn mouths of the vessels where the placenta had been attached; for in general the signs of disease were at this point furthest advanced, and sometimes were met nowhere else. According to the more extensive observations of *M. Tonnellé*, however, the greatest amount of disease was generally seen in the lateral veins of the uterus. In the generality of cases the whole venous system of the uterine parietes was affected; and in numerous instances the veins of the ovaries, the whole veins of the uterine appendages, and even the vena cava were involved in the same disorder. In some remarkable instances the hypogastric, crural, and iliac

veins were extensively affected, while the veins of the uterus and its appendages, as well as these organs themselves, were perfectly healthy,—and nevertheless the patients died under the characteristic symptoms of puerperal fever. The diseased appearances consisted in wrinkling, whiteness, and opacity of the inner coat of the veins, with sometimes the formation of a pseudo-membrane or a thin layer of pus, and more generally the effusion of a large quantity of purulent matter, which filled, and even distended their cavities. Hence, when the substance of the uterus was cut through, there appeared to be a series of abscesses in its texture; and it was only by cutting up the apparent abscesses, and tracing the purulent deposits along the course of the veins, that the real nature of the cavities was discovered. This affection sometimes went on to suppuration in an inconceivably short space of time. In a patient, who had the first symptoms of puerperal fever twenty-four hours after an easy delivery, and died twenty hours after their invasion, the whole veins of the uterus were found enormously filled with purulent matter. The *Inflammation of the Lymphatics* was generally confined to the lymphatic vessels of the uterus itself, but sometimes also affected those of the ovaries and the hypogastric vessels, sometimes even the abdominal glands, nay occasionally the thoracic duct itself. The internal membrane of the inflamed lymphatics was sometimes thickened and irregular, but more commonly it presented no alteration of appearance except a dull tint or yellowish discoloration; and the chief character of their inflamed state was, therefore, the accumulation of purulent matter in their cavities, which, like those of the veins, were often distended with that fluid. *M. Tonnellé* considers the want of decided appearances of inflammation in the coats of the lymphatics to be no argument against the notion, that the purulent matter was formed by an inflammatory process carried on in the vessels themselves; for, granting that the pus might have been derived from absorption merely, he contends that simple opacity and whitening of so delicate a membrane as the inner coat of the lymphatics, and even the veins, constitute sufficient evidence of that membrane being in a state of inflammation. The inflamed lymphatics, he remarks, are easily distinguished from the inflamed veins by their superficial position on the sides of the uterus, and on the surface of the broad ligaments,—by the whitish, milky appearance they communicate to the peritonæal membrane over them,—by their vicinity to the great veins, their tortuous direction, and the remarkable dilatations or pouches which they present here and there in their course.

As this author's remarks on inflammation of the lymphatics

are novel, we may transfer to our pages the heads of two of the best of his examples, where not only the lymphatics of the uterine system, but even also the thoracic duct were affected.

" 1. A woman, 31 years of age, was attacked with rigors, feverishness, and pains in the lower belly and loins on the same day on which she was delivered safely of her first child. She was immediately bled largely from the arm, and fifty leeches were afterwards applied to the belly. Next day the pains were excessive, and the lochia suppressed; she had nausea, flushed features, and acute fever; and therefore the blood-letting and leeches were repeated. On the third day her features were collapsed; she had delirium, tympany, incontinence of urine and fæces, small irregular pulse, and alternate prostration and restlessness; and she expired the same evening.—On dissection pus was found infiltrated between the layers of the broad ligaments. Lymphatic vessels filled with pus formed thick white tortuous cords, with many dilatations, on the surface of the broad ligaments and sides of the uterus, and round the veins,—which were empty. The lymphatic glands of the loins and groins were as big as pigeons' eggs, grayish-coloured, infiltrated with pus, and easily crushed between the fingers. The thoracic duct was as thick as a goose-quill, and filled with a thick, yellowish liquid, undistinguishable from purulent matter. The cavity of the peritonæum contained a pound of flaky serum.

" 2. A young woman had considerable œdema of the limbs in the eighth month of pregnancy. By-and-bye she was attacked with rigors, vomiting, and headach, and next day with convulsions and coma, which returned frequently for two days. She recovered, however, and eventually was safely delivered. But on the day after she had rigors and pain in the lower belly, for which fifty leeches were applied. Next day the lochia were suppressed, the pain became general, the fever violent, and the vomiting troublesome. Leeches were again applied. But on the third day there was delirium, restlessness, difficult articulation, tremor of the lips, dullness of the expression, profuse fluid, fetid purging, dry tongue; and she died on the evening of that day.—The inner surface of the uterus was covered with a brown sanies, and superficially softened; the cellular tissue uniting the peritonæum with the body of the uterus, as well as the broad ligaments, were infiltrated with purulent matter; the greater part of the lymphatic vessels were filled with the same fluid, and formed, as in the preceding case, large knotty trunks, especially on the sides of the uterus. This state extended also to the lymphatics of the belly; and the thoracic duct itself was enormously dilated and filled with pure pus. The cavity of the peritonæum contained a large quantity of puriform serum. The left ventricle of the heart was slightly hypertrophied."

The observations of *MM. Tonnelle, Dance, and Duplay*, have clearly traced the frequent connexion between the typhoid symptoms of puerperal fever, and the occurrence of inflamma-

tion in the veins and lymphatics of the uterus. The first-mentioned author, indeed, takes care to show, as will be seen presently under the head of the symptoms, [p. 344,] that this pathological appearance is far from being an invariable accompaniment of typhoid fever after delivery,—in short, that typhoid symptoms may originate in various pathological conditions. But the writings of all the four French authors satisfactorily prove that very many instances of typhoid puerperal fever depend on nothing else than inflammation of the uterine veins or lymphatics, just in the same way as a typhoid fever of a very aggravated description may be produced by inflammation of the veins in other parts of the body; and that the symptoms which occur in most cases of inflammation in the uterine veins and lymphatics correspond exactly with those assigned by older authors to the putrid puerperal fever, or worst form of typhus after delivery.

The last set of morbid appearances which we have to notice, as connected with the organs of generation, comprehends *Softening and Putrescence of the Uterus*; which *M. Tonnelle* and his predecessors have considered apart from the effects of inflammation of the same organ, because they do not admit that it is always, or even ever, of an inflammatory nature. The first accurate account of softening of the uterus was given in 1793 by *Boër*; * whose, attention, however, was then confined in a great measure to the most aggravated form, or what he termed putrescence of the womb. Under the same name several pupils of the German schools published Inaugural Dissertations on softening of the uterus between the years 1810 and 1825; † in 1819 it was brought prominently before the physicians of Vienna by the epidemic to which we have already alluded; and besides, frequent notice has been taken of it, as may be seen from the essay of *M. Luroth*, by several systematic writers in Germany during the last twenty years. In the paper of *M. Luroth* a short but comprehensive and interesting view has been given of the views of the German pathologists as to the nature of putrescence of the womb; and the author has likewise described from personal observation several other kinds of softening of that organ,—without, however, stating that he considers them merely varieties of that which Boer and his countrymen term putrescence. The late *M. Desormeaux* described softening of the uterus in the *Dictionnaire de Médecine*;

* *Abhandlungen und Erfahrungen geburtshülflichen Inhalts*, B. iii. See also his *Naturalis Medicinæ Obstetriciæ Libri vii*. Printed at Vienna in 1812.

† *ZIMMERMANN*, de *Putrescentia Uteri*, Lips. 1815. *LOCKER*, de *Putrescentia Uteri*, Berol. 1819. *KAISER*, de *Sphacelo Uteri gravidæ observ. illustrata*, Jenæ, 1810. *SCHMIDT*, de *Putrescentia Uteri*, Götting. 1825. *LAPPICH*, *Observata de Metritide Septica*, Vindobon. 1823.

and *M. Danyau*, a late graduate of Paris, took it for the subject of an excellent Inaugural Dissertation, which, however, we have not seen. Finally, *M. Tonnellé*, retaining the two terms softening and putrescence, as employed by Luroth, states that they have appeared to him mere varieties of the same general affection,—for which we conceive the appellation of softening seems the most appropriate, as the occurrence of putrefaction in any instance is the very reverse of probable.

In its incipient stage softening of the uterus, according to the observations of *Luroth*, consists in a serous infiltration of the substance of the organ, in consequence of which the parietes become extremely flaccid and are very easily cut. The colour, however, is not materially altered; and, although the inside of the uterus is usually lined by an excessively fetid pulp, this is no proof that the softening of the parietes is allied to gangrene or putrefaction; because the same fluid is sometimes found when the substance of the uterus is sound; and when the two appearances occur together, a little care will enable the dissector to ascertain that the odour does not necessarily adhere to the softened uterus. This form of the disease is rare. *M. Tonnellé* does not seem to have witnessed it at all. It is certainly rare, when compared with what *M. Luroth* considers its more advanced stage,—but *M. Tonnellé* the first stage,—where the texture of the uterus is softened almost to a pulpy consistence, like an apple which has begun to decay, and consequently tears in the fingers when it is raised, or breaks down into pulp when squeezed between them. Softening of the uterus of the latter kind has been extremely common in all the epidemics of puerperal fever, which have been observed in Vienna and Paris. It is sometimes partial, being confined either to patches of the uterus, or more commonly to a thin layer of its entire inner surface; but very frequently it is quite general, and affects the whole extent and thickness of the parietes. The colour of the texture is sometimes unaltered, sometimes rather paler than natural, occasionally rather darker. The smell of the softened parts is not putrid, but it requires some care to satisfy one's-self of this, as the disease is always attended with a horribly fetid effusion on the inner surface. The parietes are sometimes thickened and spongy; but at other times they are attenuated, or, as it were, *atrophied*. In its extreme degree softening becomes the *putrescence* of the uterus of *Boer* and other German pathologists. Even then the tissue of the parietes has not a putrid odour; for the overpowering putrid smell exhaled by the organs of generation, according to *Luroth*, is still owing entirely to the dark pulp which lines the inner surface. This circumstance, which seems to have been

overlooked, not only by Boer and his countrymen, but likewise by M. Tonnellé, led to the name by which this, the highest degree of softening, has been generally known, and likewise to the notion entertained by some that it is of the nature of gangrene. Even in its worst form, softening of the uterus was sometimes produced, like suppuration of the veins, with a rapidity for which it is extremely difficult to account, unless we adopt the opinion of Boer,—that it commences before delivery. In one of M. Tonnellé's cases the patient, two days after an easy delivery, was attacked with the first symptoms of mischief, and died in twenty-four hours; yet the whole thickness of the uterus over two-thirds of its extent was reduced to a brown pulp destitute of every trace of organization, and capable of being crushed between the fingers with the greatest facility.

Among the 222 cases of puerperal fever examined by M. Tonnellé, there were forty-nine in which the uterus was found softened; and among these the softening was superficial in twenty-nine, but deep in no fewer than twenty. This statement gives some idea of its frequency. When the softening was superficial, it was generally also in scattered patches only; when deep, it commonly affected the whole extent of the organ. Superficial softening was always accompanied with some other affection, such as peritonitis, simple metritis, or inflammation of the uterine veins. The same was also generally the case in the instances of deep softening; but frequently the softening of the uterus was obviously the chief disorder; and in some instances it existed alone. It was obviously connected with very marked typhoid symptoms in every instance where the disorder was extensive and advanced, even when no other pathological change concurred with it.

The opinions of the authors who have noticed softening of the uterus is much divided as to its nature. Some, such as M. Duplay, consider it always the consequence of inflammation, and a few even view it as nothing else than gangrene. Luroth and Tonnellé, however, contest the accuracy of the last doctrine, and with some success. Decided gangrene of the uterus is always, as Luroth observes, preceded by acute inflammation, which is seldom remarked in the worst cases of uterine softening; in gangrene the parietes are unnaturally thickened, which in softening is far from essential; in gangrene there is an inflammatory circle or other boundary which limits exactly the mortified part, while in softening there is no such circle, no exact boundary, but a gradual passage into the surrounding firm texture; and in gangrene there is a peculiar odour of the diseased tissue, but in softening no such odour is remarked, if

care be taken to remove the inner pulpy layer. The question of the origin of softening of the uterus in inflammation is a much more doubtful one. Most of the authors who have noticed it consider that in some cases inflammation is its cause, because in its slighter degrees it is always attended with other unequivocal indications of simple metritis, peritonitis, or phlebitis. They do not, however, conceal the difficulty thrown in the way of this doctrine by the circumstance, that in its extreme degree softening is sometimes not preceded by any obvious signs of inflammatory action, and generally that the antecedent inflammatory reaction bears no relation whatever to the extent and degree of the softening. We shall not endeavour to discuss the question here. But we may remark in general terms that from the analogy of other effects of inflammation, such as the gangrene, suppuration and infiltration which follow spreading cellular inflammation, the difficulty here stated does not appear a very insurmountable one. *M. Tonnellé* is disposed to consider that the inflammatory appearances are secondary, and that softening of the uterus in the first instance is unconnected with inflammation, and probably dependent on a morbid state of the blood.

Softening of the uterus is observed most generally after delivery; but *Boer* and his countrymen have rendered it not improbable, that general softening of the uterine parietes occurs in an inferior degree during pregnancy, and may be the cause of the subsequent development of putrescence of the uterus after delivery, as well as of occasional rupture of the uterus during labour, and likewise of death of the foetus during the latter months of utero-gestation. The attention of the Parisian pathologists does not seem to have been turned to the question of the occurrence of softening before delivery; at least the papers of *Tonnellé*, *Dance*, and *Duplay* contain no allusion to it.

None of the authors whose researches we are considering has been led to view the manner in which the three chief morbid appearances now related,—inflammation of the peritonæum, inflammation of the uterine veins and lymphatics, and softening of the uterus,—are related to one another. A striking and obvious circumstance, however, is that, although very often united, each has been met with singly, and yet in connexion with all the symptoms of puerperal typhus.

We shall now conclude this sketch of the pathology of puerperal fever by noticing shortly the *Subsidiary Morbid Appearances* found in other parts of the body besides the neighbourhood of the organs of generation. Of these the most frequent were inflammatory affections of the pleura and lungs, and purulent deposits in the joints and among the muscles. The frequency

of these and other subsidiary appearances may be gathered from the following numerical statement by M. Tonnellé. Among his 222 cases, twenty-nine exhibited the usual signs of pleurisy, which was generally circumscribed; and in six others there was effusion of blood, and in eight effusion of serum into the cavity. The lungs were affected in twenty-seven cases, that is with circumscribed peripneumony in ten, abscess in eight, tubercles in four, gangrene in three, and apoplexy of the lungs in two. In fourteen cases there were purulent infiltrations and deposits in a great number of muscles; in ten deposits in the joints; in six deposits in the cellular tissue of the pelvis; besides three cases of bloody infiltration in several muscles, and two of the same appearance in the cellular tissue of the pelvis. Luroth also mentions cases of purulent deposits in the subcutaneous cellular tissue; and M. Tonnellé observes that in cases of recovery it was sometimes necessary to evacuate matter by incisions. There was also abscess of the liver in three, and of the pancreas in two cases. The remaining appearances were probably but little connected with the principal disease, such as softening, ulceration, and perforation of the stomach, enteritis, gastro-enteritis and colitis, dilatation and hypertrophy of the heart, and dropsy of the pericardium.

M. Luroth, M. Tonnellé, and M. Dance have entered in their papers into the question whether the subsidiary affections here noticed are all the effect of inflammation, and more particularly whether the purulent deposits found among the muscles, in the cavities of the joints and in the cellular tissue are the result of an inflammatory process excited in the particular parts. That the deposition of pus in these quarters was the consequence of local inflammation in some instances can scarcely be doubted, because the occurrence of inflammatory action was in these instances marked by pain, swelling and redness during life, and by surrounding hardness and vascularity in the dead body. But in many other cases no such proofs were found. There was no symptom whatever to direct the physician's attention during life to the particular spots affected; and the pus was thrown out without any other sign whatever of inflammation among the textures with which it lay in contact. These facts have often been noticed before by those who have studied the secondary effects of inflammation of the veins in other quarters of the body; and in consequence it is the prevailing opinion that the purulent matter is conveyed from the diseased veins by the blood-vessels, and thrown out where it is found by a process of secretion. Such is the opinion adopted by all our authors, but without advancing any argument in its favour in addition to what had been advanced before. The reader will find

this curious topic discussed in the review of *Mr Arnott's essay* on Phlebitis in our number for April 1829. In that review doubts were expressed whether sufficient evidence had been at that time adduced in support of the general belief that in inflammation of the veins the general circulating mass becomes impregnated with purulent matter. We do not find in the papers now before us any farther proof of the correctness of the doctrine.

M. Tonnellé's attention does not seem to have been very pointedly drawn to the state of the brain in his inspections; at least he seldom mentions it specially in his narrative. It is reasonable, however, to infer from his silence that it was not affected. *M. Dance* indeed found injection of the arachnoid and pia mater, as well as some serosity effused into the ventricles of the brain, in several of his cases. But these appearances cannot be considered as decidedly morbid. At all events no satisfactory sign of cerebral inflammation was ever found, even when the symptoms during life were such as almost to lead the physician to consider the disorder of the brain the only serious part of the patient's illness.

We pass next to the view which *M. Tonnellé* has presented of the symptoms of the different forms of puerperal fever, and of the mode in which the several forms of it are associated with the morbid appearances detailed above.

Puerperal fever as it has appeared lately in Paris may be divided in relation to the symptoms into the inflammatory, the typhoid, and the anomalous or ataxic species. Of these by far the most frequent was the typhoid variety; the ataxic was the most rare; and the purely inflammatory variety occurred in 39 of the 222 fatal cases.

The *Inflammatory* species of puerperal fever is considered by *M. Tonnellé* as of two kinds,—the purely or permanently inflammatory, and the ephemeral inflammatory, or that which rapidly gives place to typhoid symptoms. The purely inflammatory kind was connected with simple inflammation of the peritonæum or uterus, and sometimes too with secondary derangements of an inflammatory nature, namely pleurisy, peripneumony, pulmonary apoplexy, hydrothorax and hydro-pericardium. Its symptoms presented two distinct stages in its course, the one set connected with congestion, the other with suppuration in the organs chiefly affected. The symptoms of the first stage or period were shivering and pain in the abdomen, sometimes confined to the middle of the hypogastrium, sometimes to one or both iliac fossæ, sometimes extending over the whole lower belly, and generally appearing on the second or third day after deli-

very,—then diminution or cessation of the lochia,—flaccidity of the breasts,—nausea and vomiting,—general heat,—hardness and frequency of the pulse,—alternate paleness and flushing of the countenance,—brilliancy and redness of the eyes,—a sense of weight or pain in the head,—dryness, with redness or whiteness of the tongue. The secondary disorders indicating congestion in the lungs, alimentary canal, liver, or brain, were attended each with its corresponding symptoms, which it is unnecessary to enumerate. They all added to the severity of the disease, with the exception of congestion in the intestines, which was attended with diarrhœa, and usually appeared to promote a tendency to resolution. In favourable cases determination to the skin succeeded the symptoms now mentioned, and commonly put an end to the disease. In other cases suppuration occurred. The approach of this the second stage of the inflammatory form of puerperal fever, was usually announced by a temporary improvement and the fresh accession of rigors, which has led some physicians incorrectly to assign to puerperal fever a remittent type. When suppuration was fully established, the pain in the belly usually became less severe or even disappeared altogether, but in some instances it continued stationary or increased. At the same time an aeriform fluid began to distend the belly, to the great addition of the patient's torment; and in many cases a fetid sanies flowed from the vagina, and pus was secreted by the breasts. Secondary inflammation was also frequently excited in the pleura or lungs. In fatal cases the state of restlessness, heat of skin, hardness of pulse, and possession of sense and strength sometimes continued to the very last; but in other cases a kind of oppression of all the functions, resembling the stage of stupor in common fevers, preceded death for some time. In favourable cases the febrile state disappeared under profuse perspiration and commonly also diarrhœa.

The *Typhoid* form, however, we have already said, was by far the most frequent species of puerperal fever in the late Parisian epidemic. It occurred in almost every instance where there was found after death softening of the uterus, inflammation of the veins, or inflammation of the lymphatics. The typhoid symptoms were preceded in almost every case by an inflammatory stage; which, however, varied very much in intensity, and still more in duration. It was rarely well-marked, and sometimes did not last above a few hours. From the very beginning of these cases, there was a peculiar expression of languor and oppression in the patient's appearance, from which the experienced eye of M. Desormeaux, the able physician of the hospital, rarely failed to predict the approach of the typhoid form of the disease. By-and-by the senses and intellectual faculties

became confused, the complexion yellowish or even bluish, the look languid, the eye dry and dull; and the patient was affected with sounding in the ears, sluggish articulation, low, sombre delirium, stupor, and prostration, with occasional loud crying and violent agitation. At the same time the pulse was frequent, small, and irregular, the breathing difficult, the abdomen tympanitic, the skin covered with clammy sweat, the alvine discharges fetid, profuse, and involuntary; while eschars formed on the parts of the body on which the patient rested, and a sanious matter flowed from the vagina. Amidst this excessive disorder of the general system, the signs of the secondary diseases usually found after death were seldom prominent during life. Yet an attentive inquiry could generally discover some indications of them, and more particularly of the formation of purulent deposits in the joints, and among the muscles. In some instances, too, the disordered state of the intellectual functions, and of sensation, even masked the inflammation of the uterus and peritonæum.

The *Ataxic* or *Anomalous* form, which was very seldom witnessed at the Parisian hospitals, is so named by *M. Tonnellé*, on account of the extreme irregularity in the course and combination of the symptoms in cases of the kind. The symptoms were great restlessness, delirium, and prostration, alternating with one another,—fits of fainting, paroxysms of suffocation, temporary disorders of the circulation, and of calorification,—and frequently also symptoms of a very acute inflammation of the uterus or peritonæum. When these occurred in cases where, after death, the morbid appearances were scarcely appreciable, or not at all proportioned to the urgency of the symptoms, and incapable of accounting for death, the cases were considered as belonging to the ataxic form. *M. Tonnellé* considers the peculiarity of such cases to consist in an inordinate sympathetic derangement of the brain and nervous system, excited in the first instance by the local disease, but, when once excited, re-acting on the local disease and modifying its course. The examples he has given of the present variety are very pointed, and extremely interesting.

While he relates numerous instances of these three kinds of puerperal fever as connected with more or less extensive derangements of structure in the uterine organs and peritonæum, *M. Tonnellé* also admits that cases have occurred in the Hospital of Maternité, which could not be considered any thing else than puerperal fever, and in which, however, no morbid appearance could be found in any part of the uterus or its appendages. In illustration, he has related one instance where, after a very tedious and painful labour, followed by considerable hemorrhage, the patient was seized with fever on the third day, which assum-

ed the typhoid form, became accompanied with gangrene of the labia, and proved fatal on the eleventh day,—and where the uterus and its vessels were healthy, the lungs gorged, the heart flaccid, the blood fluid, the brain soft and pale. He has also given the particulars of another case, where fever appeared on the eighth day after delivery, and almost from the commencement presented a typhoid character, so much so that in a very short time eschars were formed on the breasts, the sacrum, the labia, the fore-part of both thighs, and the heels,—and where, after death, which happened on the tenth day of the fever, there was found a healthy state of the uterine organs, together with the appearances observed in the lungs, heart, blood, and brain of the former patient, and also perforation of the stomach. It is to such cases as these, where the lochia continue to flow, that we presume some obstetric practitioners in this country would restrict the designation of puerperal fever. They are probably to be regarded as cases of typhoid or rather synochous fever, occurring accidentally in the puerperal state; but as this question has not been discussed by our author, it would be out of place were we to enter on it here.

The last topic which shall engage our attention is the *Treatment* pursued by M. Desormeaux in the epidemic of the Parisian Lying-in Hospital, as reported by M. Tonnellé. On this subject the author has entered into considerable details, chiefly to establish what treatment answers best in the several stages of the disease, and to prove that different methods are attended with different degrees of success at different seasons, even during the same epidemic.

The more active remedies were general blood-letting, leeches, ipecacuan, and mercurial salivation; the subsidiary remedies were chiefly the warm-bath and hip-bath, laxatives, clysters, cinchona, cataplasms, and emollient lotions of the uterus. A tabular view of the success attending the employment of the more active remedies is given at the end of the chapter on the treatment; and from this table it appears that of 165 cases comprehended by it, no fewer than fifty-six died, or fully one-third.

M. Desormeaux, taking an enlarged view of the many contradictory statements previously published as to the remedies best adapted to the treatment of puerperal fever, resolved to make fair trial of every active remedy which had been commended by practitioners of repute, and for this purpose to employ it at different seasons, notwithstanding its apparent failure at one period of the epidemic. Commencing with general blood-letting, he found that it was often signally useful, or even imperatively

required for subduing the general re-action of the circulation in cases of the pure inflammatory kind ; but that although it commonly had this effect in the early stage of such cases, it seldom subdued in a satisfactory manner the local inflammation, and was always a remedy of questionable propriety, on account of the extreme rapidity with which the inflammatory stage was sometimes followed by typhoid symptoms, if the blood-letting did not prove effectual. For these reasons, and also more particularly because local blood-letting, while it had all the constitutional effect desired, appeared likewise much more effectual in subduing the inflammation of the uterus and its appendages, he soon came to substitute in most instances evacuation by leeches for general blood-letting. Leeches were commonly applied on the belly to the amount of forty or fifty, the wounds being made to bleed by the hip-bath, and afterwards a poultice ; and this practice was repeated sometimes twice or thrice, according to circumstances, even in thirty-six or forty-eight hours. When their effect was salutary, an immediate abatement or removal of pain took place, followed very speedily by copious perspiration. This remedy was of course available chiefly in the early stage of the disease before suppuration had set in ; but was also frequently resorted to afterwards as a remedy against subsidiary inflammation in the chest and elsewhere. The degree of success may be gathered from the following numerical statement. Among the 165 cases formerly mentioned, 82 were treated by general or local blood-letting as the principal remedy ; and of these sixty-three or fully three-fourths recovered.

The next remedy we shall mention, and which was also employed only in the early stage, was Ipecacuanha as an emetic. The administration of emetics, in a disease where it would at first view seem important to preserve the organs of the abdomen as much as possible from agitation, has been decried by some practitioners as absurd, and abandoned by others, after what they considered a fair and unsuccessful trial. But M. Desormeaux considered the first reason against the use of emetics to be rather a specious than a solid objection ; and on making the experiment, found that the second reason against them was not more substantial, and derived an apparent foundation solely from the propounders of it having neglected the influence of season on the utility of remedies. He remarked, that, on first using Ipecacuanha as an emetic towards the end of 1828, he derived from it incontestable advantage,—that during the greater part of the subsequent year it was very seldom of any use, though never, so far as he could judge, injurious,—that in September and October of that year, while the weather was cool and moist, and the epidemic at its worst, this remedy

again became signally effectual,—and that towards the end of October, and for the remaining months of the year, it was again inert. Among the 165 cases which *M. Tonnellé* has chosen for exemplifying the effects of remedies, forty were treated with *Ipecacuanha* as the chief remedy; and of these thirty-two, or four-fifths, recovered. This remedy was employed chiefly in the early inflammatory stage, was of no use in the simple inflammatory puerperal fever after the stage of suppuration had set in, and was equally useless in the typhoid type of the disease. It was given seldom oftener than once, and in the dose of eighteen grains. When its effect was salutary, vomiting ensued, which was sometimes violent, sometimes trifling,—afterwards purging, especially when the vomiting was slight,—and also in every successful case copious sweating, unless the purging was profuse, which then seemed to take the place of the discharge by the skin. The sweating usually followed the vomiting almost immediately, and the pain of the belly was relieved very soon afterwards. Commonly in a very few hours there was a marked amendment in the patient's state; and if this did not occur within the first twenty-four hours, the remedy was abandoned, and recourse was had to other measures.

Hitherto we have seen no remedial means for the typhoid variety of the disease, or the suppurative stage of its inflammatory variety; and indeed many will entertain serious doubts whether any such means can be found in the whole range of the *materia medica*. But *M. Desormeaux* and his pupil *M. Tonnellé* have satisfied themselves that the accoucheur possesses a powerful remedy even for the worst cases in *Mercurial Salivation*. Any one who considers the nature of the pathological states of the uterine system and peritonæum connected with typhoid puerperal fever, or the suppurative stage of the inflammatory form, will see that in by far the greater number of such cases the issue in ordinary circumstances must be fatal; and, consequently, that there is substantial reason for the assertion of *M. Tonnellé*, that a very moderate degree of success with any given remedy is sufficient evidence of its utility. Hence, although of 43 cases, where mercury was used as the principal remedy, only 14 recovered, or one-third, this apparently trivial success may be really an important gain. On the whole, we conceive strong presumption has been adduced of the utility of the remedy. It was employed only in the advanced stage of inflammatory puerperal fever, or in typhoid cases; in both of which circumstances blood-letting, leeches, and *Ipecacuanha* were no longer available. The mercury was used in the way of friction chiefly, two ounces of ointment being commonly rubbed every twenty-four hours into the skin of

the abdomen and thighs in portions of two drachms. In many of the cases where it was successful the symptoms leave no doubt that suppuration had taken place; and in some there is unequivocal evidence from the history of the cases that the veins were inflamed, nay that purulent deposits had taken place before the remedy could be brought into action. When in such a conjuncture, amidst extreme depression of the system, and all the worst concomitants of epidemic puerperal fever, we find the vigorous employment of this powerful remedy followed in two or three days by sudden amendment, and that amendment concurring with the supervention of the customary mercurial affection of the mouth,—it appears unreasonable to withhold assent from the opinion which the physicians of the *Maternité* have formed in its favour. In all successful instances the operation of the mercury was attended with marked changes in the state of the principal disordered functions. The most common of these was profuse perspiration, which, as usual, was soon followed by great abatement of pain, and much improvement of general comfort; and not unfrequently the perspiration was immediately preceded by abortive attempts at the establishment of salivation, and followed in a day or two by considerable ptyalism. In other cases the determination took place rather to the bowels, so as to induce profuse purging; which, however, instead of being accompanied with exhaustion, rather tended to restore the prostrated strength. Sometimes salivation, perspiration, and purging, occurred together in the same case; more commonly salivation with only one of the two other discharges; and occasionally one discharge alone. Another common attendant of the mercurial action was the gradual but rapid formation of a healthy purulent discharge from the uterus by the vagina.

We have already extended this article to so great a length, that, however important the topic with which we are at present occupied, we must now conclude with a very brief notice of the *Subsidiary remedies* formerly enumerated. The *Warm-bath* was used only in the commencement of the Simple Inflammatory cases, and when the skin was dry as well as hot. The *Hip-bath* was employed in all cases and stages of the disease, both as a bath, and for the sake of cleanliness. *Laxatives*, according to the prevailing French system, were seldom much insisted on; and the mildest only were resorted to. *Oleaginous and farinaceous clysters* were used as emollient applications. *Poultices* on the whole abdomen were invariably used, and always gave relief; nor did the patient ever complain of their weight or pressure, as might have been expected from the extreme tenderness of the belly. *Emollient injections* into the uterus were constantly practised every four or six hours, and were considered by M.

Desormeaux of essential consequence by removing the putrid matter which formed on the inside of the uterus. *Blisters* were often applied to the calves of the legs as a stimulant application when the patient fell into a state of prostration, oppression, and stupor; but they were never applied to the abdomen. *Opiates* were occasionally had recourse to when the purging was too profuse. *Cinchona* was usefully employed in some cases of tedious convalescence, rendered so either by the severity of the disease, or the debilitating effects of the mercurial erethism.

ART. II.—1. *On the Diseases and Injuries of Arteries, with the operations required for their Cure; being the substance of the Lectures delivered in the Theatre of the Royal College of Surgeons in the spring of 1829.* By G. J. GUTHRIE, F. R. S., Professor of Anatomy and Surgery to the Royal College of Surgeons, Surgeon to the Westminster Hospital, &c. &c. &c. London, 1830. 8vo. Pp. 416.

2. *On Aneurism and its Cure by a new Operation. Dedicated by permission to the King.* By JAMES WARDROP, Surgeon to his Majesty. London, 1828. 8vo. Pp. 117.

BY the researches of Scarpa, the experiments of Jones, and the learned inquiry of Hodgson, so much light was thrown on the nature of aneurism, and the wounds and usual injuries of arteries, that it might be deemed difficult, if not superfluous, to undertake the same train of investigation, with the hope of ascertaining any new facts, or communicating any valuable results. The partial views of Scarpa on the nature and origin of aneurism were well rectified by Hodgson; and the result of his inquiries was a theory of the formation of this disease more consonant with the actual facts than that of the Italian professor. The varied experiments of Jones, taught us so much on the effects of wounds and injuries of the arterial tubes, and on the nature of arterial hemorrhage and the mode of its suppression, that in few departments of surgical pathology could the surgeon feel more confident of possessing precise information and well established principles. The researches of Bertin and his pupil Bouillaud, though directed particularly to diseases of the aorta, tended nevertheless to illustrate the formation and peculiar characters of arterial disease in general; and not the least important result of these researches is the general confir-

mation of the accuracy of the conclusions of Hodgson, and the refutation of the too exclusive theory of Scarpa.

Of the truth of the first of these propositions, Mr Guthrie seems in some degree aware, when he informs his readers that the object of the first part of the present work is to demonstrate the value and importance of that portion of the pathological collection in the Museum of the Royal College of Surgeons, which relates to the subject of aneurism; and to prove that the labours and researches of Mr Hunter anticipated nearly all the observations which have been made by his contemporaries and successors. Without entering on the question of the value of the angiological part of the collection, it may be safely asserted, that, whether Mr Hunter anticipated the discoveries of his contemporaries and successors, is now a point of small importance to the interests of science. Had surgeons and pathologists trusted to the Museum of the College only, the pathology of aneurism might have remained nearly in the state in which it was at the death of its industrious and diligent collector. The subject has been much and laboriously investigated; various important facts, illustrating both its formation and its mode of treatment have been adduced; and the main practical points have been determined in a satisfactory manner. The labours of Mr Hunter, therefore, become, in the present state of things, matter rather of curious inquiry than of any practical utility. It is nevertheless gratifying to the admirers of the genius of that eminent person to perceive that he who laboured with such skill and success to improve other departments of physiology and surgery, was not less distinguished for the assiduity with which he investigated the formation of arterial disease.

In this respect the commentary with which Mr Guthrie illustrates the preparations of the great pathologist may be interesting to those who delight to observe the progress of scientific inquiry, and to trace the successive steps by which the eye of observation arrives, amidst numerous impediments and complications, at the last result of the inquiry.

A more valid recommendation of the labours of Mr Guthrie, nevertheless, will be found, we are convinced, in the practical illustrations which his own experience has enabled him to supply. It could scarcely be imagined, indeed, that a surgeon of the mind of the present author, whose professional career has brought him familiar with numerous varieties of injuries and wounds, more or less immediately implicating the arterial system, could direct his attention to the subject of aneurism and its collateral affections, without communicating useful and interesting information. When we say, therefore, that the portion of the work in which he adduces his own personal infor-

mation, and the conclusions derived from it, is decidedly the most valuable, we believe that we do no more than express an opinion which those who have studied the researches of Scarpa, Bichat, and Hodgson will generally participate. As a commentary on the doctrines established by Hodgson, the work of Mr Guthrie possesses great value. As a depository of facts illustrative of the formation and treatment of different varieties of arterial disease, it is particularly entitled to the attention of the surgical reader.

Omitting the preliminary observations on the structure of arteries, we proceed at once to the remarks of Mr Guthrie on the alterations in structure to which they are liable. Inflammation, the first of these, he regards as of two kinds, phlegmonous and erysipelatous. The former variety is distinguished by being circumscribed, by effusing lymph, and by the mildness of its constitutional effects;—the latter by spreading along the tube, generally towards the heart, by its symptomatic character, and by the typhoid and fatal nature of the concomitant symptoms.

To the chronic form of inflammation, after the example of Bertin, Bouillaud, and other continental authors, he ascribes the various alterations found in the arterial tissues. The first effect of this process he represents to be abatement of their natural elasticity, which leads to dilatation with general extenuation of substance, though without abrasion or rupture. He allows, however, that the impaired elasticity is generally accompanied with palpable changes; for instance, softening of the inner membranes, partial or general irregular thickening, or deposition of cartilaginous, calcareous, or atheromatous matter between the coats.

Mr Guthrie properly represents the first marks of this species of change to be a whitish or yellowish exudation, of cartilaginous aspect, but softer in consistence, which afterwards becomes a patch projecting internally, and in which calcareous matter is subsequently deposited in numerous small spots. He takes some pains to prove that this matter is deposited in the substance of the thin internal membrane, and adduces to this effect the evidence of twelve preparations in the Hunterian collection. The distinction we conceive is of no great moment; and whether it originates at the inner surface of the proper coat, as maintained by Bichat, or the outer surface of the inner, as said by others, or in its substance, as believed by Mr Guthrie, or in the intermediate cellular tissue, as maintained by Breschet and Jourdan, is in truth of no moment whatever to the practical application of the fact. The pathologist must know that there it is, and when it takes place it indicates that the physical and physiological properties of the arterial tunics have begun to be impaired. The effect of an inflammatory process, they may in

turn produce this, and, by causing suppuration or ulceration, form in the arterial tunic a breach sufficient to make it give way, and, if a large vessel, to destroy the patient.

On the subject of the atheromatous and steatomatous depositions, the only thing deserving attention is the confirmation derived from the specimens preserved by Mr Hunter. The influence of this deposition, which was first described by Stentsel, in the production of aneurism, has been so fully considered by Scarpa, Hodgson, and others, that it is superfluous here to resume the subject.

Mr Guthrie enters on the consideration of aneurism by drawing an accurate distinction between it and preternatural dilatation, which he allows to be a uniform enlargement of the whole circumference of the vessel; while in aneurism the tumour appears to grow from one side only. In both he allows the tunics to be diseased; but while in dilatation they are sufficiently healthy to prevent the blood from adhering to the internal coat in forming clots, in aneurism the internal coat is either so much diseased as to prevent the blood from flowing over it with facility, and thereby to cause coagulation, or its removal renders this coagulation in the stratified shape a necessary result. He admits further, that even in aneurism the removal of the inner coat previous to deposition and coagulation is not necessary; for the simple circumstance of mere disease of this coat, by reason of which it loses its smooth polished surface, is quite sufficient to produce the effect. This loss of polish he ascribes to increase of action approaching to inflammation, yet inadequate to the production of albuminous effusion and false membrane, and equally inadequate to the organization of the coagulated blood. The coagula of aneurism also are deposited in concentric layers, or spherical shells; while in preternatural dilatation they are either in the shape of soft clots, or in that of amorphous masses, or are entirely wanting, until the inner tunic becomes so altered as to render coagulation a necessary result. Laceration or rupture of the inner and proper arterial tissue, Mr Guthrie does not regard as a necessary character of aneurism; for in several instances of lateral and uniform dilatation, which he allows to constitute *true aneurism*, these coats may be found perfect even after maceration. This condition, however, is confined principally to small, that is, incipient aneurisms; for he admits that, as they enlarge, the inner and proper coats appear to be removed by absorption, and in some cases to be ruptured. The following account of the process deserves attention.

“ The first step in the formation of an aneurism in a part of the aorta which is even preternaturally dilated, is the deprivation of a greater portion, if not the whole, of the remaining elasticity which

the part possessed. This is followed, if not accompanied, in general by the deposition of a curdy yellowish matter at the spot, which now becomes dilated to the whole extent of the deposit, and this probably regulates the size of the opening between the aneurismal sac and the artery generally. The dilatation is usually at first more or less circular or oval, from the size of a large pin's head upwards, to any extent the artery will admit of. In some instances, it seems to form a sort of split or fissure, rather than an oval opening. If an aneurism of the size of a pea, or of the end of the finger, be examined by making pressure round it, a small quantity of the yellowish curdy matter may frequently be pressed from under the inner coat, which yields to allow it a passage. If a careful dissection be made from without inwards, the three coats may be always distinctly shown, and this same yellowish matter demonstrated as dependent on the middle coat. From the first moment that the aneurismal dilatation takes place, and before it is large enough to admit the end of the little finger, it becomes filled with a soft coagulum, forming a striking difference when compared with the enlarged but empty preternaturally dilated aorta, in which this little aneurism is situated. From the moment the spot yields so as to form the commencement of an aneurismal sac, the edge of the artery surrounding or enclosing this sac becomes thicker and firmer, so as to form a distinct thickened, yet well-defined, although rounded, edge. This edge, which seems to be the product of a healthier inflammation than that which gives rise to the deposit of atheromatous or yellowish curdy matter alluded to, forms a boundary to the mischief, as healthy inflammation is established in other parts of the body previously to the formation of a separating line between the sound and the mortified. Over this edge the inner and middle coats of the artery may always be traced; and even throughout when the sac is small, and for some distance beyond the edge when it is large. In the last case, they soon become confused, and are often so blended together as not to be traced, although at others the termination of the inner coat may be seen as if it had been irregularly removed or torn. It is only then in small aneurisms that the structure of the sac can be fairly traced; for when they have attained a large size, the aggregation of matters external to these, and the slow but continued action which is going on, render a distinct separation of the component parts of the sac impossible."—P. 56.

It is well known that Scarpa maintains that the essential character of aneurism consists in laceration of the inner and proper coats, and distension of the cellular coat and the surrounding parts into a sac variable in size and shape, according to the date of the aneurism, and the yielding or resisting nature of the latter parts. This doctrine was considerably modified by Hodgson, who showed that, on the one hand, rupture of the inner coats may take place without producing aneurism, and that, on the other, though aneurism often begins with rupture, it al-

so often begins without this lesion, and proceeds a considerable way before the rupture takes place. M. Bertin and his pupil Bouillaud, attaching to the term aneurism its literal etymological signification, still further modify this doctrine; and contend that the term aneurism, as defined by Scarpa, is a contradiction, in so far as the disease so designated by this author consists not in dilatation but in erosion and rupture of the arterial tunics. This lesion, to which they restore the ancient epithet of *false aneurism*, and in which they regard the formation of a sac as a circumstance purely accidental, they represent as totally distinct from *true aneurism*, which they define to consist in partial lateral dilatation of the aorta, from diminished resistance of its walls, with the deposition of *coagula* irregularly piled rather than arranged in strata or layers. To a third variety of aneurismal tumour again, which Hodgson represents to be, if not the most common, at least equally common with the aneurismal tumour of Scarpa, that namely which, commencing in dilatation, terminates in rupture and extravasation with the formation of a sac, Bertin and Bouillaud agree with the old practical authors in restoring the appellation of *mixed aneurism*.

These distinctions are probably important in an anatomical and pathological point of view, because they tend to render clear and specific our notions on the original formation of aneurismal tumours, and the changes which they undergo in the successive stages of their progress. They have assuredly contributed, nevertheless, to introduce not a little misunderstanding and a good deal of useless controversy on the characters of the disease named aneurism; and of this we think an instance is exhibited by the author before us. Mr Guthrie, commenting on the doctrines of Scarpa, and the two French authors, informs us, "It is distinctly stated by Scarpa, by Bertin and Bouillaud, and they have been followed by all contemporary authors, that an aneurism cannot form at the root, or in any part of the ascending aorta, in consequence of the want of cellular structure which does not there exist." Now, though it certainly results from the facts adduced by Scarpa, and from the definition which he gives of aneurism, that an aneurismal tumour cannot take place at the *very root* of the aorta without speedily producing rupture of the pericardial covering of the vessel, it cannot be said to be distinctly stated by Scarpa that this is the fact, nor does he any where say that no aneurismal tumour can exist at the *ascending* part of the aorta. The words which the Professor of Pavia uses are these. "Such is the case whenever the internal and muscular membranes of the aorta are ruptured in that portion of the artery included within the pericardium, which is only covered by a thin reflected layer of it. In this particular circumstance of place

and structure, as soon as the proper coats of the aorta are ruptured, the thin membrane is lacerated at the same time, and the blood is immediately effused into the cavity of the pericardium." And he then refers to several examples of this species of fatal hemorrhage recorded by Walter, the Berlin physicians, and Morgagni, and relates one observed by himself. In the third general inference, indeed, he states that "dilatation of the aorta in the vicinity of the heart does not constitute, properly speaking, the essence of aneurism;" but he no where says that aneurism cannot exist at this part of the aorta.

But whatever opinion be entertained as to the justice of employing this mode of refuting the hypothesis of Scarpa, the observations of Bertin and Bouillaud, it is evident, apply solely to *mixed aneurism*; and we think they might have escaped being classified under the same head. By *true aneurism* they distinctly state that they understand simple partial dilatation of an artery; and this, they add, they have repeatedly seen in the thoracic aorta, and have distinguished with facility the three arterial tunics. Whatever weight, therefore, is to be allowed to the facts exhibited in the preparation adduced by Mr Guthrie, as an argument against the accuracy of the opinions of Scarpa, that preparation is so far from being hostile to the views of Bertin and Bouillaud, that it is altogether a strong confirmation of their justice. Taking the essential characters of the preparation from Mr Guthrie's own account, we find that a tumour as large as a common fist, involving the beginning of the aorta, so as to include the semilunar valves and beginning of one coronary artery, consisted of a dilatation of all the coats of the greater part of the circumference of the artery. "The commencement of the sac," says Mr Guthrie, "and for at least two inches or more, is decidedly formed of all the coats of the vessel, constituting what is called a *true aneurism*; and I believe that the disease of the inner coat on its removal led to the formation of layers of coagulum below, constituting that part a false aneurism." In this case, therefore, though combining the two characters of true and false aneurism, as the former belonged to the origin of the artery, it is manifest that there is no refutation of the opinions and distinctions of the French pathologists.

We do not doubt, nevertheless, that Mr Guthrie may be perfectly right in his conclusion, that the rupture of an artery or the alternative of the formation of an aneurismal tumour depends not on the presence or absence of the cellular coat, but on the kind of disease by which the arterial tunics are attacked. In other respects the question appears to be of very small moment; and it is perhaps a distinction scarcely sufficiently

important to demand so much attention, that an artery dilated or diseased, or both, gives way at the first in one individual, and in others a few weeks after, from the pericardium being a little more extensible in the latter than the former. On these topics, however, it is superfluous to dwell more at length, and we close this discussion by stating in the following manner the general results to which his researches have led Mr Guthrie.

1st, Preternatural enlargement may exist with a natural appearance of the coats of the artery, but with impaired elasticity. Though in some instances the arterial coats, chiefly the proper, are extenuated, in general, the external and proper coats are thickened, and the inner, which is softened, is readily detached. More positive appearances of disease are atheromatous, the white or the cartilaginous deposit, occasionally with the calcareous.

2d, True aneurism is generally the result of the atheromatous or steatomatous disease of the middle coat. It may be combined with the cartilaginous or calcareous deposition; but this complication is altogether accidental.

3d, Mr Guthrie does not attempt to specify the circumstances which constitute the difference between the state of the inner coat in *preternatural dilatation* and *true aneurism*, and which determine the stratified coagulation in the latter case, and the amorphous or the absence of coagulation in the former. He is inclined to regard the distinction as too refined; and he allows that in large dilatations, forming a prominent sac from the arterial canal, there are generally concentric layers, so that the distinction is here obliterated.

4th, To rupture of the inner and proper coats followed by dilatation of the outer, and to removal of these coats, or true aneurism, Mr Guthrie restricts the denomination of *false aneurism*. The subsequent rupture of the cellular coat, so as to convert the sheath, and eventually the surrounding parts, into a sac, he regards as a modification of this, under the name of consecutive or external mixed false aneurism.

5th, Simultaneous rupture of all the coats depends not on the absence of cellular sheath, nor on the want of cellular tissue, but on peculiar disease of the proper and inner coats, leading to ulceration and rupture, and not distension. In parts abounding in cellular tissue, it may constitute spurious aneurism; in those void of it, it causes mortal hemorrhage.

6th, *Aneurism* in the young is generally the consequence of some accidental injury or local disease of the part in which it is situate, without affection of the arterial system generally. *Preternatural dilatation* is more common to the aged, and is

accompanied by general lesion of the arterial system, and frequently by aneurism.

The modes in which arterial tumours terminate bear relation to the kind of tumour. These modes are understood to be three ;—coagulation of the contents of the tumour, sloughing, and obliteration from pressure of the sac on the artery.

Of these modes of termination the first is nearly excluded from the preternatural enlargement, in which there is supposed to be little or no coagulum till the approach of death, or the removal of the inner membrane, when the disease assumes the aneurismal form. It is chiefly therefore in true aneurism, Mr Guthrie contends, that this result takes place ; and it is chiefly in arteries of the middle or inferior class that it is observed in perfection. In the aorta he maintains this is not the agent of cure ; but the canal is closed by the slower process of inflammation of the inner coat, with effusion of lymph ; while the collateral vessels undergo simultaneous enlargement.

This inference, however, as to the invariable occlusion of the arterial tube, we must remark, is diametrically opposite to that deduced by Mr Hodgson from a considerable number of cases,—a conclusion, we may add, which is confirmed by other observers of not less accuracy. The facts adduced by Mr Hodgson established the three inferences, *1st*, That a deposition of coagulum may take place in an aneurismal sac to such an extent as entirely to preclude the communication between its cavity and that of the artery from which it originates ; *2d*, That a sac thus filled cannot prove fatal by rupture ; and, *3dly*, That the gradual absorption of its contents, and the contraction of the sac, may proceed to such extent as to effect the cure of the disease without any obstruction taking place in the calibre of the vessel from which it originated.—(Cases 20th, 21st, 22d, 23d.)

The value of these facts is fully recognized by Bertin and Bouillaud, who indeed admit that coagulation is one of the principal means of the spontaneous cure of aortic aneurisms ; and in proof of this, refer not only to their own 36th case, but to those of Hodgson, two of which they detail ; and it is a remarkable circumstance, that, while they allow the sanative power of the process of coagulation, they admit at the same time, that the canal of the aorta is never completely obliterated by the accumulation of *coagula*. In arteries of the second and third order, on the contrary, obliteration is much more frequent ; yet even in these vessels, aneurismal sacs are occasionally cured without obliteration of the arterial canal. The only object of practical importance is to ascertain the circumstances which favour or oppose the perviousness of the arterial canal ;

but on this point we do not perceive that Mr Guthrie adduces any satisfactory information.

Whether the arterial tube is diminished or obliterated, the process is attended with enlargement of the collateral communicating vessels, and occlusion or obliteration of the lower openings. The first of these effects is stated by Mr Guthrie, as by most authors, in terms greatly too general; for it is by no means in all cases that this enlargement is sufficient to maintain the circulation. In many cases it is so imperfect, that gangrene of the member takes place from the inadequate supply of blood. The circumstances connected with this event are ably discussed by Mr Hodgson, (p. 259—265;) and we find them still more fully impressed by Mr Guthrie, in a subsequent part of his work, when speaking of the powers of the collateral circulation, pp. 137, 138. The second result, though regarded hitherto as scarcely a natural effort, Mr Guthrie infers, is often attempted with success. From the number of aneurismal tumours, indeed, preserved in the Hunterian collection, in which every opening, except the superior one is obliterated, he thinks it may be established as a principle, that in aneurism of the extremities nature resorts to this method as part of the curative process. Since these preparations, however, show that when the lower end of the artery is obliterated, the enlargement of the tumour has not been arrested, he infers that more is requisite to complete the cure by filling and obliterating the tumour, (No. 386, 392, 397.) Although, therefore, he admits, that if, from any combination of circumstances, the current of blood through the superior opening could be arrested or moderated, while the lower openings are closed, he infers that the coagulation of all the fluid blood of the tumour is a possible event, though by no means so certain as to be depended on; and he concludes, therefore, that the coagulation of the fluid contents of the tumour is by no means the necessary consequence of the closure of the lower opening or openings.

The termination by sloughing Mr Guthrie regards as precarious and dangerous in its nature. Of three cases of inguinal aneurism, in which he observed this result, one recovered and two perished, not under the gangrenous, but the subsequent suppurative process, the irritation from the ulceration having in both cases extended to the hip-joint; and, but for the occurrence of which, he thinks, they also would have recovered. Hodgson had previously seen one instance only of recovery, which was effected by cicatrization in the course of twelve months, and one instance of death during the sloughing process.

Of the possibility of the third mode of termination, Mr

Guthrie entertains great doubts. He does not indeed deny the fact, which he admits to have occurred ; but he regards it a mere hypothetical mode of ascribing to mechanical pressure the obliteration, which is the result of inflammation and adhesion of the arterial tunics. Of all the preparations in the Hunterian collection, in which compression is evinced by the change of direction which they have undergone, in one only, he remarks, namely a case of aneurism of the carotid, is the artery obliterated.

The medical treatment Mr Guthrie restricts either to internal aneurisms, those namely beyond the reach of operation, or to external ones dependent on aneurismal diathesis. The latter circumstance may be suspected when two or more aneurisms appear to form in the same patient about the same time, or when, with manifest external aneurismal tumours, there are proofs of internal ones, or aortic disease. Yet in the same subject peculiar circumstances may induce the formation of more than one aneurism, which may subsequently prove to be independent of the aneurismal diathesis. Thus the subject of the well-known case, in which Sir E. Home operated for popliteal aneurism in each leg, remained for years free from every aneurismal symptom, and was afterwards under the care of the present author for other complaints. It is only, therefore, when internal aneurisms are complicated with symptoms of cardiac and arterial disease, that medical treatment is admissible, according to Mr Guthrie. This, however, is too confined a view of the influence of medical treatment, which may be efficacious to a certain extent in external and local aneurisms. Surgeons in general place too little reliance on remedies merely medical, and repose too implicit confidence in the operative measures, partly from ignorance of the influence of the former, partly from exclusive confidence in the powers of the latter. It is nevertheless certain, that the unsuccessful issue of many operations, is clearly to be traced to the constitutional susceptibility of the patient, and to the indisposition of the arterial tunics to assume the simple adhesive action, and the readiness which they manifest in obedience with the constitutional causes to fall into the suppurative, disjunctive, and gangrenous inflammation. That this tendency might be always modified and diminished, and often extinguished, by previous judicious medical treatment, is a position which no observant surgeon will deny, and of the use of which no skilful practitioner will fail to avail himself. Even in cases in which the arterial tunics are not altogether healthy, the application of the ligature is more likely to be attended by simple adhesive inflammation, after the system has been reduced to a state of tranquillity by proper remedial and dietetic measures,

than when it is fresh from all the usual exciting causes of the circulation, and which operate so readily on the actions of the capillaries. For these reasons we conceive there is no case of external and simple local aneurism in which medical treatment is superfluous; and occasional blood-lettings, rest, low diet, and the abstraction of all stimuli, will exercise the most beneficial influence on the system and on the subsequent operation. It would be always desirable, further, that these remedial and dietetic measures should be conducted at the residence of the patient, the apartments of which should be large and well-aired, rather than within the walls of a crowded hospital, the air of which exercises a deleterious influence on the health of such patients.

The influence of the collateral circulation, as a means of counteracting the pernicious effects of aneurismal obstruction, and restoring the current of blood, have been at once elaborately and beautifully investigated by Scarpa and Hodgson; and Sir Astley Cooper has given several interesting examples of the powers of the anastomosing branches in maintaining the circulation when it is interrupted through the main artery of a limb. The observations of Mr Guthrie tend not so much to elucidate this branch of the subject as to explain the circumstances in which the collateral circulation occasionally fails to realize the expectations of the surgeon. One circumstance we learn which we should not have believed, were it not supported by the testimony of the author, that the accompanying vein is not unfrequently included in the ligature along with the artery. Whether this ligature of the vein be or be not the cause of the gangrenous inflammation which follows, as Mr Guthrie thinks himself justified in concluding, is of little moment indeed. It is, at all events, very likely to render the operation worse than abortive, by inducing venous inflammation—a disease almost invariably fatal. The practice, therefore, is decidedly bad, and cannot be too strongly reprobated; and Mr Guthrie justly impresses the necessity of avoiding either tying the vein with the artery by mistake, or wounding the vein so as to require to tie it intentionally.

He places also less confidence in the collateral circulation than others have hitherto done; and we believe, on the whole, that its influence has been rather overrated. His views on this subject may be understood from the following general results.

“ 1. That the collateral vessels are at all times, and under all circumstances, capable of carrying on the circulation of the upper extremity, whatever disease or injury may affect the principal trunk. Whenever the reverse takes place, it is an exception to the general rule.

“ 2. That after operations for aneurism of the lower extremity, the

collateral branches are almost always able to carry on the circulation through the limb.

" 3. That when the principal artery of the lower extremity is suddenly divided without any previous disease having existed, mortification is not an uncommon occurrence, and is more likely to take place in old than in young persons.

" 4. That when under such circumstances the principal veins is also divided, mortification seldom fails to be the consequence."

In the surgical treatment of aneurism the ordinary method by ligature of the cardiac or upper division of the artery in which it is situate, and all the circumstances essential to its successful issue, have been long familiar to the practical surgeon. It is well known that it was with the view of avoiding the evils of opening the aneurismal sac according to the old method, and of tying the artery where it was likely to be diseased, that Mr Hunter proposed the method of tying the vessel at some distance above the tumour, which was further left untouched. Excellent, however, as was this method of operating, it is now known that it by no means invariably interrupts the course of the blood through the aneurismal tumour. The very agent on which the surgeon relies for the success of this operation, may for the same reason be the means of rendering it abortive. Though the collateral vessels which maintain the communication between the arterial trunk above the aneurism, and the ultimate branches below it, constitute the channel by which the limb must be supplied with blood when its main artery is enclosed in a ligature, these vessels may occasionally be the means of retarding the cure, or rendering it incomplete. One or more branches arising above the ligature may anastomose with vessels arising below it, or with vessels actually communicating with the aneurismal sac, and in this manner continue partially to supply it with blood after the current in the main tube is interrupted.

This inconvenience of the Hunterian operation, which was experienced by Chopart, and anticipated by Deschamps, is admitted in the fullest manner by Hodgson, who connects it with the fact, that pulsation continues in several cases of aneurism after the application of the ligature, and that the vessel is actually found pervious and of good calibre on dissection, (p. 267—271—274,) several years after the performance of the operation. Mr Guthrie arrives at a similar conclusion, but thinks the continuance or recurrence of pulsation of little moment, as it generally disappears in a short time. To show, however, that even this expectation may fail to be realized, he details two cases, in one of which, after ligature of the femoral artery for popliteal aneurism, the tumour had received a temporary check only, and recurred, so as at the end of four years to require amputation,—which

was followed by death in the course of eight hours ; and on inspection of the parts, it was found that the femoral artery was obliterated for half an inch at the tied portion, and that two branches equal in size to half the diameter of the femoral artery communicated with the continued trunk. The blood conveyed by these branches had in all probability maintained the perviousness of the artery. In the other case in which the femoral trunk was also tied for popliteal aneurism, the swelling, pulsation, and pain recurred in the course of a few months, and only disappeared after wearing a firm roller over the tumour night and day for two months.

The facts now stated, therefore, were well known to surgeons ; and Sir Everard Home many years ago was led from these to infer, that " simply diminishing the force of the circulation in an aneurismal artery is sufficient to effect a cure of the disease, or at least to stop its progress, and to leave the parts in a situation from which the actions of the animal economy are capable of restoring them to their natural state." It was certainly not so much on this principle, as from the imagined difficulty of tying several arteries on the superior or cardiac side of the tumour, that Desault proposed to revive a method of operating originally suggested by Brasdor, professor in the ancient school of surgery at Paris, and that Deschamps undertook to perform this operation in a case of aneurism of the common femoral artery. The circumstances of this operation, which are fully detailed in the work of Desault, published by Bichat, show that several branches must have communicated with the vessel between the ligature and the tumour. The same form of operation was performed for the second time by Sir A. Cooper in London, in a case of external iliac aneurism ; and though the tumour diminished afterwards, death finally took place from the aneurism bursting below the peritonæum. These two cases were certainly insufficient to determine the merits of this mode of operating ; and it was rather on theoretical grounds than on experimental proof that it was condemned in the strongest terms by Allan Burns. Several years after this, all the circumstances relating to its merits and applicability as a remedy were most judiciously and happily canvassed by Hodgson. While this author admits that the facts recognized in operations, according to the method of Hunter, appear to justify the experiment of applying a ligature to an artery below an aneurismal sac, where it may be difficult or impracticable to apply one above it, he comes to the conclusion, that the effect of tying an artery immediately below an aneurism, in a case where no branches originate from the sac, or from the artery between the ligature and the tumour,

has not hitherto been determined by experiment. "The termination of the two cases," he remarks, "in which this practice has been tried, by no means destroys the probability of a happier result under other circumstances. There is strong reason to believe, that if no branch originated from the aneurism, or from the artery below the aneurism, the blood would coagulate in the tumour, and that a cure would be accomplished by the absorption of this coagulum and the contraction of the sac." (P. 302.)

These are the conclusions of a candid, unbiassed, and philosophical mind. However prepossessed in favour of the Hunterian method, which is certainly recommended by its simplicity and physiological consistency, it is impossible to deny that it is not altogether candid to denounce the ultra-aneurismal operation at once without trial. Impressed with such considerations as these, Mr Wardrop, who had long meditated on the practicability of the operation, conceived that it was deserving of trial in that class of aneurismal tumours in which it is either difficult or wholly impossible to perform the ordinary operation. The arguments used by this ingenious surgeon in favour of the method are the following :

"Now let us consider what will happen if the ligature be placed beyond, or on the distal side of, the aneurismal tumour, and in a case where no branch either passes directly into the tumour, or comes off from the trunk between the tumour and the ligature. No sooner is the ligature in such a case tied, and the usual course of circulation interrupted, than, as after the Hunterian operation, the anastomosing vessels dilate and perform the function of the obliterated or obstructed trunk.

"It might be expected, that, at the same moment of tying the ligature, the resistance thus given to the circulation would cause an increased impetus to the vessel to propel its contents, not only against the ligature, but against the parietes of the tumour. But this increase of impetus, we know, can continue but a very short time ; for, when a vessel is divided or tied, in a few hours branches of the divided trunk, which can only be supplied by anastomosis, freely carry on the circulation ; and the cases in which this operation was performed, and where the tumour was large, prove that, instead of increasing in a few minutes after the vessel was tied beyond it, the swelling diminished,—a circumstance which was ascertained by the skin covering it, which was tense and ready to burst, suddenly forming into wrinkles."

Mr Wardrop further argues, that by this operation the aneurismal sac is placed in a situation altogether analogous to one of the modes in which the spontaneous cure is observed to take place. The direction of the current of blood is changed ; the blood of the sac is placed in a passive condition in regard

to the circulation ; and its motion, if not entirely interrupted, must be rendered so languid and irregular, as to favour powerfully speedy coagulation and consolidation of the tumour. He further maintains, that, by placing a ligature on the distal side of the tumour, the fluid blood finds a ready exit into the trunk from which it came, and returns to the circulation, in place of having to pass, as in the other case, through capillaries into veins, and that the risk of secondary hemorrhage is greatly diminished.

In confirmation of the soundness of these views, Mr Wardrop has published four cases of carotid aneurism, and two of the *innominata*, in which this method of operation was employed. Of the cases of carotid aneurism two recovered, and of these one, we have been since informed, has turned out to be a case not of aneurism, but of bronchocele ; two terminated fatally, one from hypertrophy of the heart, the other from hemorrhage of the tumour ; and in this it was found that the cardiac opening of the carotid artery into the sac was closed by a firm clot of blood, while ulceration is stated to have taken place on the anterior and tracheal side of the artery, at the point where the ligature was applied so as to allow blood to escape from the part above the ligature. In the fifth case, in which Mr Wardrop tied the subclavian artery for aneurism of the *innominata*, the pulsations in the tumour were reduced for some time, and the patient was in every respect relieved ; but on the ninth day pulsation in the carotid became perceptible,—a circumstance which Mr Wardrop ascribed to the circulation in that vessel being restored after interruption from the pressure of the aneurismal tumour. After lingering in a state of great emaciation and increasing weakness, the subject of this case was attacked by *bronchitis*, from which, under the use of the antiphlogistic regimen, she recovered, and continued for some time free of complaint, but eventually fell a victim to the aneurismal disease. From the report of the dissection of this case, which is quoted by Mr Guthrie, it appears that the aneurismal tumour was a solid fleshy mass, extending from the origin of the *innominata* to its bifurcation ; the carotid was pervious, but the subclavian was divided ; and its two sections were contracted, and the area was closed. It appears doubtful, however, whether the ligature of the subclavian produced any effect on the aneurismal tumour.

In the sixth case, in which aneurism was believed to affect the *innominata* and carotid, the origin of the latter vessel was tied by Mr Evans of Belper with the effect only of obliterating the right brachial artery, producing atrophy of the right side of the face, and rendering the tumour stationary. But Mr Guth-

rie is of opinion that this suspension of the disease is only temporary, and that it will follow the same course as that of Mr Wardrop's case.

The same form of operation has since been performed by Mr White in a case of inguinal aneurism in the Westminster Hospital, by Mr Montgomery of the Civil Hospital at the Mauritius, in a case of supposed aneurism of the carotid, and by Baron Dupuytren, in a case of subclavian aneurism,—all terminating unfavourably. In the first case the sac sloughed; in the second the sac inflamed, suppurated, and burst; and in the third case the operation appears to have precipitated the fatal termination, by aggravating the symptomatic effects of the aneurism.

It must be regarded as a fortunate circumstance, that this form of operation was submitted to experimental proof, under the auspices of Mr Wardrop; for it has thus obtained as fair a trial of its remedial powers as it is ever likely to do in aneurism. Though two cases, as remarked by Mr Hodgson, are inadequate to decide its merits, the same cannot be justly asserted of eleven,—the number in which it has now been employed; and we believe that every unbiassed judge must admit, that if its effects, theoretically considered, seemed ambiguous, if not positively pernicious, they must now be allowed to exercise the most unfavourable influence on the aneurismal tumour. It seems, indeed, highly questionable, whether this mode of operating really places the blood of the aneurismal sac at rest, or out of the circulation, any more than the barrier generally found at the lower part of the sac can do. The blood must still be poured in from above; and it appears not unlikely that, if an aneurismal sac is already disposed to inflame, to slough, or to burst from over-distension, a result by no means unfrequent, the ultra-aneurismal ligature is the most likely means of precipitating this event. We must here ask the question, whether the rupture was not thus occasioned in the operations of Deschamps, Sir A. Cooper, Mr White, and Mr Montgomery? It is a mistake to imagine that the effect of the operation of Hunter is confined merely to interrupting the current of blood through the sac. One of its most beneficial effects is to put an immediate stop to the daily increasing distension of the tumour, and to allow the arterial tunics time to contract. In the new operation, however, so little is this effect allowed to operate, that it is directly counteracted; and if the tumour was before distended, it must become more so afterwards.

On the whole, there seems but little reason to believe that the ultra-aneurismal ligature can be of any service in effecting a permanent cure of the disease; and the experiments already

instituted hold out no encouragement to attempt their repetition. Of the cases in which the operation has been tried, only one can be said to be a cure. If it be argued that the others are not favourable cases for the experiment ; we reply they are quite as favourable as any cases of aneurism ever are. When the operation succeeds, it does so, not by interrupting the current of blood through the sac and causing coagulation, but by producing inflammation of the arterial tunics, effusion of lymph, and closure of the arterial tube and the sac, either in part or entirely. This, however, is a result so rarely obtained, that it can by no means be relied on ; and the measure must be ranked with those which are resorted to, not because they answer the purpose, but because those which answer the purpose are difficult or impracticable. One thing we think, which Mr Guthrie has established as far as it is susceptible of demonstration, is, that in aneurism of the *innominata*, instead of being likely to cure the disease, it is much more likely to accelerate the fatal result.

Waiving, however, in the meantime, the question of the admissibility of this operation in aneurism viewed as aneurism simply, let us consider the physiological effects of the operation on an arterial tube, the tunics of which are unable to convey the fluid propelled by the forcing action of the heart. What we beg to ask is the effect of placing a ligature round a wounded artery *below* the wound, or what would be thought of the proposal to do so as a means of suppressing the hemorrhage, and effecting union of the divided tunics ? Would it not be regarded as acting in direct opposition to the clearest and best established principles regarding the functions of these vessels ? Would a ligature in such a situation not be justly regarded as not only inadequate to close the breach, but as likely to render it larger than before ? It avails not to reply to these questions by asserting that the cases are not similar, and that what may be bad for a wounded artery may be good for an aneurismal one. We assert, without the smallest apprehension of contradiction on any good evidence, that, so far as all practical measures are concerned, a wounded artery and an aneurismal one are in circumstances exactly similar. The coats of the vessel are at one point unable to act, as containing and conveying walls to the moving blood. They are daily and hourly becoming less adequate to this important function ; and, though the surrounding parts may for some time answer imperfectly a similar purpose to that of the original one, at no distant period, each successively gives way ; the suppurative, the ulcerative, or the gangrenous process commences ; or all three may be combined ; and as tissue after tissue is destroyed, and slough after slough escapes, a communication more or less free with

the cavity of the artery is established ; and after this it is superfluous to mention what follows. The aneurismal artery thus becomes eventually the wounded artery ; and in this light must it be viewed by the practical surgeon. Yet so little is this event contemplated by the ultra-aneurismal ligature, that the consummation is in truth rather precipitated than retarded by its application. From the moment that the ultra-aneurismal part of the artery is tied, the consequence most likely to follow is the enlargement, the distension, and the rupture of the tumour. By this the aneurismal dilatation is most likely to be converted into aneurism by rupture ; and aneurism by rupture must in all probability become a large, ragged breach, in the arterial tunics, in which the united effects of ulceration and laceration co-operate with the impulsive force of the blood, to bring the disease to a fatal termination.

The subject of wounded arteries is in every respect as important as that of aneurism ; and this Mr Guthrie has treated with the judgment and ability which might be expected from his great practical experience in the public service. The observations which he makes are most valuable ; but so much in detail, that we cannot undertake to generalize them in any other form than that in which they are presented by the author in his conclusions, which we therefore subjoin :

“ 1. When a large artery is divided and bleeds, the wound should be enlarged if necessary, and a ligature placed on both the divided ends ; but if the artery be only injured and not quite divided, the ligatures should be applied one above, the other below the injured part. The artery may or may not be then cut across, at the pleasure of the operator, but the limb or part must be placed in the relaxed position. A bandage should not be applied, and the edges of the wound should be simply brought together by adhesive plasters, which do not extend completely round the limb.

“ 2. If muscular fibres intervene between the artery and the surface, they should be divided, if they cannot be readily turned aside, so as to give a clear and distinct view of the wounded vessel and its accompanying veins or nerves.

“ 3. If the wound pass indirectly to the principal artery, from the back of the thigh for instance to the femoral artery in front, or from the outside of the arm to the humeral artery on the inside, the surgeon may (on satisfying himself of the part likely to be injured, by the introduction of a probe,) cut down on the vessel opposite that part supposed to be wounded, by the most simple and approved method. When the artery is exposed, the probe will point out the spot at which the vessel has in all probability been wounded. Pressure made below this spot on the artery, will cause

it to be distended and to bleed, if the flow of blood be not prevented from above ; when the artery is to be secured by two ligatures, and the lower one should if possible be applied first.

" 4. A tourniquet should never be applied in an operation for aneurism or for a wounded artery. Compression by the hand is allowable in the course of the vessel when wounded.

" 5. The blood from the upper end of a divided artery, or that nearest the heart, is of a scarlet arterial colour.

" 6. The blood from the lower end of a divided artery, or that which is furthest from the heart, is of a dark or venous colour, when it happens to flow immediately after the division of the vessel. At a subsequent period it may assume more of the colour of arterial blood, but it rarely does so for several days after the receipt of the injury, and always flows, or at least until a very late period, in a continued stream.

" 7. This regurgitation or flow of blood from the lower end of a divided artery is a favourable sign, inasmuch as it shows that the collateral circulation is in all probability sufficient to maintain the life of the extremity.

" 8. The collateral circulation is in almost every instance capable of maintaining the life of the upper extremity when the axillary artery is divided.

" 9. The collateral circulation is not always capable of maintaining the life of the limb when the femoral artery is injured. It is scarcely ever equal to it when the vein is divided at the same time, or rendered impervious.

" 10. The collateral circulation is sufficient to maintain the life of an extremity in almost every case in which an aneurism has existed for seven or eight weeks, although it might be incapable of doing this if the principal artery had been suddenly divided, without any previous disease having existed in the part.

" 11. The theory and the operation for aneurism are never to be applied to the treatment of a wounded artery, whilst the external wound communicates with the artery, unless it is impossible or impracticable to tie the bleeding vessel.

" 12. When an artery is wounded, and the external opening heals, so as to give rise to a diffused or a circumscribed aneurism, it is to be treated according to the theory of aneurism occurring from an internal cause, with this difference, that, as the artery is sound, the operation may be performed close to the tumour ; and that if any doubt exists as to the capability of the collateral circulation to support the life of the extremity, the operation should be performed at the injured part, as in a case of wounded artery. See Mr Collier's case, page 310.

" 13. When a circumscribed or diffused aneurism has been opened, whether by accident or design, it is then placed in the situation of a wounded artery, and must be treated as such, unless the wound can be permanently closed. If the aneurism has arisen from disease of the vessel, and the wound or opening into it can-

not be permanently closed, the limb is in a worse state than if the artery had been wounded by accident; because a ligature or ligatures placed on a diseased artery is little likely to be successful. It is liable to all the difficulties and inconveniences attendant on the old operation for aneurism.

If a case of the kind should occur in a popliteal or femoral aneurism, situated at or below where the artery passes between the triceps and the bone, amputation will be the best remedy. If the swelling should occur higher up, and the opening can be closed with a prospect of its healing, a ligature may first be placed upon the artery above it; but on the recurrence of hemorrhage, the artery must be tied below, or recourse be had to amputation. It is, however, to be observed, that amputation, under these circumstances, when resorted to as a third operation, rarely succeeds.

“ 14. When an artery is wounded with a simple fracture of a bone, or with a comminuted fracture of smaller bones, with an external communicating opening, both ends of the artery are to be secured, and the limb is to be treated in the usual manner.

“ 15. When the bone broken is the femur, and the artery divided is the femoral artery, the operation of amputation will generally be advisable. It will always be so if the fracture is a comminuted one, or the shaft of the bone is extensively split.

“ 16. When the broken bone injures the artery and gives rise to an aneurism, the treatment is to be first of the fracture and then of the aneurism, as soon as circumstances render it advisable or necessary to have recourse to the operation for aneurism.

“ 17. When mortification takes place in addition to, or as a consequence of a wounded artery, amputation should be had recourse to forthwith.

“ 18. The place of operation should be in almost all cases at the seat of the original injury; but there may be an exception; viz.

“ 19. When the injury has been a mere cut, just sufficient to divide the artery and vein, immediately below Poupart's ligament, and mortification of the foot supervenes, amputation should be performed at the place of election just below the knee.

“ This rule is founded on the observation, that great efforts are made by nature to arrest mortification a little below the knee. Sometimes they succeed; when they fail, death is inevitable; and on the fact that amputation at this part or above the knee is less dangerous than at the great trochanter. The life of the part of the thigh left between the injury and the amputation will in all probability be maintained; and under the worst of circumstances, a chance yet remains by the high operation.

“ The nature and extent of the original injury may admit of some variation in the practice, but the general rule only is given.

“ 20. When mortification has commenced, and has continued for several days, and is spreading without having once stopped, the constitution of the patient being implicated as marked by fever; the amputation should not be performed until the mortification has been arrested and the line of separation has been formed. But

" 21. If the mortification has once stopped and then begins again to spread, it will never again cease to extend, and an amputation may give some chance of life.

" 22. When an aneurismal tumour mortifies, it is unnecessary and improper to tie the artery above the tumour, because it will be obliterated if the mortification is arrested by the efforts of nature, which the operation may interfere with, and even prevent. Whilst, if the mortification spreads, it will be a matter of supererogation, and only hasten the patient's dissolution. When an aneurism inflames, and is opened by ulceration, it is a proper case for amputation, if such an operation can be performed. See No. 13.

" 23. When mortification takes place after the operation for aneurism, the surgeon must be guided by the state of the patient's constitution, in resorting to or refraining from amputation.

" 24. When hemorrhage takes place from the surface of a stump, the artery should be tied at the part from which the blood comes; but if the bleeding proceeds from several small vessels, and cannot be arrested, the principal trunk should be tied above the diseased part, and the patient removed to a purer atmosphere."—Pp. 335-340.

After some remarks on aneurism by anastomosis, the work is concluded with a list of the most important operations recorded.

ART. III.—*An Inquiry concerning the Indications of Insanity, with suggestions for the better protection and care of the Insane.* By JOHN CONNOLLY, M. D. Professor of Medicine in the University of London. Taylor. London, 1830. Pp. 496. 8vo.

THIS is a work, which, although written by a physician and addressed principally to his professional brethren, nevertheless deserves an attentive perusal from all the educated ranks of the community. And if it receives the notice to which in our opinion it is entitled, there is little doubt but that in the present crisis it will contribute materially to the accomplishment of important reforms relative to the subject of which it treats.

It is well known to every reader that an extraordinary ferment has been excited throughout the whole country, but more particularly in the metropolis, by the proceedings on certain late Lunacy Commissions. The transactions then made public seem to have persuaded society at large in this kingdom, that,—notwithstanding the vast improvements which have been effected during the last twenty years in the knowledge and treatment of insanity, and in the statutes for the protection of the insane,—the reformation thus begun is but in its infancy,—that even in

these days medical men are little acquainted with the real and essential characters of insanity,—and that the present laws are insufficient, not merely to secure the proper care of lunatics, but likewise to protect the sane in mind from being confounded with the insane, and maliciously confined along with them. Nay so perverse and unlucky has been the turn taken by the proceedings alluded to, that the very men, to whom this country is chiefly indebted for the knowledge now possessed of the proper management of the insane, are the persons who have been chiefly charged with professional ignorance, and with a willingness to countenance the atrocious outrage of passing the sentence of lunacy on the sound in mind, and condemning them to interdiction and imprisonment.

It is no part of our present purpose to inquire what grounds exist for all these impressions. But we are convinced no man can rise from the perusal of the work now before us without a strong persuasion—that the present mode of providing for the care of the insane is far from accomplishing all the objects which ought to be held in view,—that general physicians are very little acquainted with the features of insanity, and will ever remain in ignorance while Lunatic Asylums are conducted as at present,—that the class of practitioners awkwardly enough known by the familiar title of Mad Doctors, have sometimes committed the mistake of pronouncing a person insane, who, if not actually of sound mind, was at all events an unfit object for such treatment as is now pursued in cases of insanity,—and that similar errors will be apt to recur, so long as this branch of the medical art is professed by a distinct class of physicians, excluded by the prejudices of the public from the general practice of medicine, and so long as private individuals, either professional or unprofessional, are allowed to keep establishments for the insane on their present footing.

The chief objects of *Dr Connolly's* work are to establish the existence of the defects and inconveniences here stated, to discover in what causes they have originated, and to point out how they may best be remedied. In pursuing these objects, he commences with some introductory remarks on the present condition of the insane throughout the British Empire. He then gives a brief, popular view of the constitution of the human understanding, dwelling chiefly on those constituents the disorders of which most frequently form the prominent features of insanity,—namely sensation, attention, comparison, memory, imagination, association of ideas, the emotions and affections, and the judgment. He next shows, how, partly by nature and partly by education, each of the mental faculties is possessed by different individuals in different degrees of perfection. He

is thus led by a natural gradation to consider the effect of such differences in constituting inequalities, weaknesses, or peculiarities of intellect, not absolutely amounting to insanity, yet nevertheless sufficient to mark out the persons, in whom they are observed, as differing somewhat from the perfectly sound in mind. This chapter is discussed at considerable length and with much care, because the occurrence of the inequalities or peculiarities in question is the chief source of embarrassment in many law inquiries relative to the existence or non-existence of insanity, and has been the main cause of the late unfortunate mistakes which have been alluded to above. The author then adds three other chapters which may be considered as supplementary to the last. In these he exemplifies by numerous instances the modifications which the intellectual powers undergo in activity from the effect of various stimuli,—from disease,—and from age. Having thus examined the characters of various disordered states of the mind, not amounting to absolute insanity, he at length proceeds to attempt the diagnosis of the insane state, and more particularly the diagnosis between insanity and the numerous peculiarities or inequalities of mind which approach to it. This object he endeavours to accomplish by taking up each faculty or power of the mind in succession, and applying a new criterion which he conceives he has discovered, for ascertaining in every instance whether a particular disorder of one or more faculties is a mere weakness or mere peculiarity of mind, or constitutes actual insanity. The book is then appropriately wound up with some practical remarks on the applications to be made of his whole inquiry,—first, to the duties of medical men in lunacy questions,—and, secondly, to the better protection and care of the insane.

We regret that out limited space, and the impossibility of analyzing such a work to advantage without appending illustrations to lighten and diversify the reader's labour, must prevent us from accompanying the author through the wide field of investigation through which he has travelled. Nor would such a sketch convey a just idea of some of his principal excellencies,—his method, his perspicuity, his felicity of illustration, and the purity and simplicity of his style,—the last of which qualities in particular can scarcely be too much prized in a medical writer of the present day. But we shall attempt to give a condensed view of the chief novelties and practical tendencies of the work.

Dr Connolly conceives, that much of the unpopularity of the present mode of providing for the care and protection of the insane, and much of the obloquy which has been lately thrown over the medical profession on the occasion of some lunacy

commissions,—have arisen from too little attention being paid on all hands to the frequent occurrence of mental peculiarities or weakness, short of absolute insanity. The observation may appear too trite to need any commentary,—and nevertheless we fear, with the author, that physicians in general, and those especially who devote themselves to the study of insanity, require to be strongly reminded of the existence in society of many men, who, although their minds are in some respects peculiar, or weak, or unsettled, are nevertheless able to discharge creditably every important social duty, and who, at all events, cannot be treated as insane,—that is, cannot be subjected to seclusion, interdiction, or restraint, as at present practised in cases of insanity,—without the gross violation of law and moral feeling, and without the strongest probability of their being reduced to the very state of mind, which it is the pretended purpose of such treatment to protect or remove. *Dr Connolly* has drawn a faithful and lively sketch of the several varieties of such men to be met with in society. Following the order previously adopted in his exposition of the constituents of the understanding, he exemplifies the peculiarities in question by instances—of disordered Sensation, as in erroneous sensations, sensorial antipathies, and sensorial illusions,—of disordered Attention, as in absence of mind, lethargy, fickleness of occupation, and exclusive pursuit of one object,—of disorder in the Comparing power, as in indecision of mind, eccentricity, credulity, and proneness to falsifying,—of disordered memory, as in general dulness and partial impairment from disease or inordinate exercise of the faculty,—of disordered Imagination, which may be either too active, as in excessive tendency to reverie, to sudden violent friendships or prejudices, to flightiness in conversation, to perpetual scheming, or too dull, as in those given to prosing in conversation, and those who want a taste for poetry and other works of fancy,—of disordered Passions, where one or more of the passions is allowed too exclusively to occupy the thoughts and regulate the conduct,—and finally, of General disorder of the faculties, as in persons who are said in common speech to be of weak mind, and are characterized by invariable error or absurdity in their conduct. Examples of these and other similar peculiarities of intellect may be daily met with, where the individuals approach more or less to the state of the insane, yet without being commonly considered such by their friends or by society. And there are some among them, whose peculiarity or weakness of mind is so great as to make them be easily enough mistaken for lunatics by the ignorant in their ordinary state, and even by the physician on a professional visit, if their minds are artfully worked on for the occasion by those who sur-

round them. But above all, there are many among them whose weakness or peculiarity would speedily end in real and confirmed insanity, if they were treated as if they laboured under that affliction, and more especially were compelled to associate only with lunatics.

One of the chief objects of the present work is to protect such persons from the injustice of being confounded with the insane. For *Dr Connolly* considers that the two classes of individuals may be separated from one another by an abrupt and simple line of demarcation. Admitting that peculiarities or weaknesses of mind are in strict language but lesser degrees of insanity,—that is, are really unsoundness of mind inferior only in degree to what is termed insanity in common speech,—he maintains that mere peculiarity or weakness may be always known by the circumstance, that while there is impairment of one or more faculties, the Comparing power remains unaffected ; whereas insanity consists in *the impairment of any one or more of the faculties, accompanied with, or inducing, a defect in the Comparing faculty.*

Taking for example disordered Sensation. A person may labour under sensorial illusions,—he may for instance, as in the well-known case of the printer Nicolai, see spectral figures enter and leave his apartment and attend him on his walks ; but, so long as the faculty of comparing is not blunted, so that by alternately turning his attention to the spectral figures on the one hand, and on the other hand to the figures of persons really present or to his recollections of incidents which convince him that the persons represented by the spectral figures cannot be present, he judges on the instant that the impressions on his sense of sight are illusive, and his actions are governed accordingly. This man is not insane. But if his comparing faculty be defective, that is, if he have lost the power of fixing his attention by rapid alternations on the spectral figures, and on the real objects or his recollections, then he ceases to discover that the first are illusive, he acts as if they were realities, and is insane.

In like manner let us take disorder of the faculty of Attention. Instances have occurred where the power of commanding the attention for the purpose of conversation is so far impaired, that the individual frequently fails to find words to express his ideas, or employs words that have no relation whatever to the meaning he wishes to convey. Such a person, however, as the author shows by a curious example, may retain the power of comparing the words used with those intended to be used,—he is conscious of his error,—and therefore, even although he may be unable to command his attention so as at once to correct it, he is nevertheless not insane. But

once take away also the comparing power, so that the attention cannot be directed in turns to the words used and those meant to be used,—he is then unable to perceive that his words do not convey his meaning, his actions correspond with this ignorance, and he is to all intents and purposes insane. The author illustrates this statement by referring to an interesting case from *Dr Burrows'* work of a gentleman, who knew his friends and could converse with them so far as to begin his sentences well and get through an exclamation or an oath, but who, after saying a few words, would suddenly proceed to repeat the words "glory glory, glorious glorious," and be greatly offended at his hearers for not understanding him. This was a case of insanity, because the man could not compare the words used with those he meant to use, and was consequently unaware the words used were incorrect.

Again let us take an example from disorder of the Imagination, and from that variety of it which is usually called Eccentricity. An individual in the better ranks of life who indulges his whim in the article of dress, falls into slovenly habits, and habitually wears old worn-out clothes. But so long as his faculty of comparison is entire, he is able to compare his dress with that of others in his station, or what he recollects to be the customary dress of his station; he is therefore conscious of his eccentricity, and upon occasion he can even throw it aside. Here there is no insanity. But if the same person should lose his faculty of comparing, so as not to distinguish his attire from what becomes his rank, and to continue to wear it, for example, on occasions of ceremony, or when he goes into company, this man would with difficulty escape being pronounced insane. And if he should add to his old dress fragments of feathers, straws, and ribbons, which, by reason of the loss of his faculty of comparison, he cannot distinguish from the decorations of rank and office, his insanity is unquestionable.

Many parallel instances might be taken from disorders of the other intellectual faculties. But those now given will be sufficient to convey an idea of the author's views. The criterion he proposes is ingenious, and appears well calculated to be of practical utility in distinguishing mere *Peculiarity of mind* from *Madness* or *Lunacy*. But we do not precisely see how it is to serve the same purpose in respect to mere *Weakness of mind* as contrasted with *Idiocy*. In both there is impairment of all or most of the mental powers, but particularly of the judgment, of which one of the chief constituents is the comparing power. In every point of view mere weakness of mind must be regarded as strictly a minor degree of the same mental state, of which idiocy is the extreme; the one passes into the other by the most insensible gradations; and it is therefore

impossible to fix the boundary between them by any definition.

While laying down the above definition of insanity, *Dr Connolly* takes occasion to show that none of those previously employed by authors will answer the same practical purposes, or indeed is of any practical use at all. It is unnecessary for us to follow him in this part of his inquiry. But we may observe, that, although he has certainly been successful so far as he has gone, he has nevertheless committed an oversight in taking no notice of what has always appeared to us the least exceptionable as well as the most practically useful of all the existing definitions,—that which makes insanity consist in “the habitual want of control over the ideas or actions.” This definition will apply, we apprehend, as a correct practical criterion, wherever that of *Dr Connolly* admits of being applied.

But after all, in regard to the most trying and momentous of the duties of medical men in cases of doubtful insanity, the important point to be decided is not so much,—whether an individual comes under this or that definition, how precise soever it may be,—as whether the degree of insanity is sufficiently great to justify interdiction and confinement. For even among those who are undeniably insane there are many who are very unfit objects for such treatment. In his chapter on the Applications of his inquiry to the Duties of Medical men, as well as in other parts of his work, the author lays down these precepts with great precision and earnestness.

In proceeding to give directions for enabling the practitioner to decide the question alluded to, with equity in respect to the patient and safety in regard to himself,—the latter of which objects appears in the present day no easy matter to secure,—*Dr Connolly* observes with great justice, that the embarrassment observed in the evidence of professional men on lunacy commissions, and the errors committed by them in granting certificates of insanity, have arisen in a great measure from the circumstance, that the law recognizes, on the point of a man's capacity to discharge his social duties, no mean between complete liberty and absolute confinement, or between complete control over his property and absolute interdiction; and what is still worse, that on the article of confinement no distinct mean is known between perfect liberty and *confinement in a lunatic asylum*. Every one who is acquainted with the varieties which occur among the insane and sound in mind is aware, and any man of education who will take the trouble of perusing *Dr Connolly's* work will perceive, that there are in the better ranks of society many persons standing on the boundary line between peculiarity of mind and lunacy, or weakness of mind and idiocy, and likewise even some persons undeniably insane to a certain

degree—whom it would be impossible to leave in the uncontrolled possession of liberty and property, without the probability of ruin to their affairs and family, or of danger to their own lives and the lives of others,—and whom nevertheless it would be the height of injustice to restrain altogether from the use of their property and to confine with lunatics, because such a procedure, besides depriving them of many pleasures which they might enjoy with safety to themselves, their property, and the persons and property of those around them, would almost infallibly aggravate and perpetuate the disorder of their mind, and so bring on a state of hopeless and extreme insanity. Such appears to have been the state of mind of the individuals whose cases have lately attracted so much attention in London, and entailed on the professional people connected with them so much obloquy and vexation. So far as a disinterested inquirer can discover amidst the prepossessions of the witnesses, and the prejudices manifested in the published reports, the state of mind of the alleged lunatics was such, that complete liberty and complete confinement or interdiction were equally unsuitable. If the public, who in the warmth of the moment took a very decided part in these cases, would now weigh the circumstances of each temperately, we are persuaded, that, like ourselves, they would consider it scarcely less reconcileable with a conscientious and skilful discharge of duty, that the physician consulted on the part of the relatives should pronounce on the side of insanity,—than that one consulted by an opposite party should decide that the mental aberration did not absolutely amount to insanity. But above all, we conceive it will be universally admitted, that the cases of Davies and some others would in all probability never have reached a court of law or needed any interference of the kind, if the Legislature had sanctioned for such persons some medium, as to the abridgment of liberty and use of property, short of absolute interdiction and confinement in a lunatic asylum. Some alteration of the kind must be introduced into the present statutes, otherwise the physician will in similar circumstances continue to labour under much embarrassment how to act; and we need scarcely add, that in consequence of the turn which the cases mentioned above have taken, the result of similar investigations in future will often be, that persons are left uncontrolled and at large who cannot long remain their own masters, without the strongest probability of ruin to their affairs or of danger to their own persons or to society.

It may be asked what is the medium degree of restraint which would answer the purposes alluded to, and at the same time be attainable in practice. But we conceive it would be absurd for any one to pretend to reply to this question, who is not well acquainted, not merely with the varying features of insanity,

and the details of the present system of management in lunatic establishments, but likewise with the various legal rights, which every member of the community enjoys, and which must be to a certain degree respected in providing for the care and protection of those labouring under the slighter forms of insanity. In the meantime, however, *Dr Connolly* has thrown out a few suggestions on the subject, some of which are obviously both important and easy of attainment. We must refer the reader for the particulars to his work; but, before taking leave of him, will allude shortly to one of his proposals.

There are, according to *Dr Connolly*, three classes of the unsound in mind, whom confinement in lunatic asylums, as at present conducted, will in general injure rather than benefit;—those who labour under mere peculiarity or weakness of mind, and the lower degrees of insanity,—those affected with most forms of symptomatic insanity, especially peurperal mania,—and convalescents of every denomination. In the case of all such persons he maintains, and we imagine few will deny, that confinement with other lunatics, however carefully classified, will retard the cure and diminish the chance of recovery; and besides, in the case of the first class, or the imperfectly insane, confinement of so rigorous a kind, as we have already observed, is altogether iniquitous. Such persons then ought never to be inmates of a general lunatic asylum; and yet it may be often desirable to impose some restraint, or in other instances to break the morbid association, the cause of the mental disorder, by removing them from their own homes. We presume it is chiefly to secure the proper management of patients of this kind that the author proposes to attach to every public asylum a certain number of smaller houses in its neighbourhood, for the reception of one or two persons, where the degree of restraint may be regulated according to circumstances, or watching substituted for restraint, and where each individual may be entirely cut off from the society of other lunatics. A provision of this nature would be of incalculable advantage to all cases of curable insanity among the better ranks, but more particularly to the inferior degrees of it, which border on mere peculiarity or weakness.

In the sketch which *Dr Connolly*, in the chapter entitled “Suggestions for the better protection and care of the Insane,” has drawn of an organized system of lunatic establishments throughout the kingdom, several hints will be found, which deserve the attentive consideration of all who take an interest in the projected reform of the statutes relative to insanity. The general tendency of his plan is to abolish all private establishments whatsoever, to increase publicity in the management of lunatic asylums, and facilitate freedom of access to them, to exclude from general asylums, as already shown, numerous

cases now admitted, which are likely to be injured rather than benefitted by such confinement, and to annihilate, if possible, the present system of restricting the medical treatment of lunatics to physicians who practice no other branch of the profession, by rendering the asylums schools for medical education. The possibility of accomplishing the last most desirable object is the most questionable of all the author's propositions. Many obstacles exist, which appear obvious enough, but which he has probably been led to overlook or underrate by the professional ardour natural to a teacher.

In the preceding notice of a work so comprehensive as this, our attention has been necessarily restricted to a few isolated points. There is scarcely a chapter of it, however, in which the reader will not find either something new, or at least original and interesting views, and an eloquent and perspicuous account, of what was already known. We would in particular recommend to the careful review of the practitioner, the chapter on the Duties of Medical Men, which is replete with sound, simple and practical advice relative to a very important part of their professional occupations.

Before concluding, we may observe, since we have repeatedly had occasion to allude to late lunacy commissions which have attracted much of the public attention,—that we have for some time intended taking notice of them, and more especially of the case of Mr Davies, which most of our contemporaries have made the subject of commentary. The only accounts, however, hitherto given of the proceedings in that extraordinary case, have appeared in the form of newspaper reports, the inaccuracy of which in parallel matters we have had many opportunities of knowing, and which in the present instance have been directly accused of publishing a false narrative. For the present, therefore, as no authentic documents, so far as we know, are to be found in print, we must depart from our original intention. On one circumstance, however, we consider ourselves entitled and called on to state an opinion. It is well known that of late, in the proceedings on more than one lunacy question, violent attacks have been made on the professional character of *Dr Burrows*,—a physician who has been long distinguished as a successful practitioner and eminent author in this department of medicine. For the reason already mentioned, we shall not enter into details on his conduct or the usage he has met with. But from the general impression communicated by the proceedings, we have no hesitation in declaring, that the treatment he received in various quarters,—from Mr Davies's counsel, from the public, and above all from the daily London press,—has appeared to us, unnecessary, harsh, and most unmerited.

- ART. IV.—1. *Nouvelles Recherches sur l'origine, &c. An Inquiry into the Origin, Nature and Treatment of the Vesicular Mole, or Hydatid Pregnancy.* By MADAME BOIVIN, Mistress-Midwife, and Principal Superintendent of the *Maison Royal de Santé* of Paris, &c. &c. Paris, Meugnon l'ainé. 1827. Pp. 80. 8vo.
2. *Recherches sur une des Causes, &c. An Inquiry into one of the most frequent and least known Causes of Miscarriage, with a Memoir on the Intro-pelvimeter,—the Prix-Essay of the Royal Medical Society of Bordeaux.* By MADAME BOIVIN, Doctor of Medicine of the University of Marburg. Principal Superintendent of the *Maison Royale de Santé* of Paris, &c. &c. Paris, Bailliére. 1828. Pp. 212. 8vo.

SOME of our readers will be led to peruse the present notice from simple curiosity,—others perhaps to pass it over with indifference,—because the treatises which form its title are the composition of a female. But before proceeding farther we may state for behoof of all, that no sign of the lady's sex will be found in any part of her essays except where she announces her condition in the title-pages. *Madame*, or as we ought rather to designate her, *Doctor Boivin*, has been long at the head of the Hospital of Maternity, and subsequently of the *Maison Royale de Santé* of Paris; and in these capacities has been in the habit of meeting the most eminent physicians and surgeons of that city in consultation, both at her hospitals and in private. The essays she has published, of which those on Uterine Hydatids, and on a New Cause of Miscarriage, are the most recent, bear every mark of high practical skill, extensive learning, and even pathological knowledge and zeal.

The first of her works we shall notice is her Inquiry into the origin, nature and treatment of the Vesicular Mole, commonly called Hydatids of the Uterus.

This singular disease, notwithstanding the latest researches on the subject,—those of *M. Percy*, contained in the *Journal de Médecine* for 1811,—is still the subject of much contrariety of opinion among pathologists and accoucheurs. It has been known to physicians since the time of *Aetius*, who has distinctly alluded to it as a disorder which had come under his notice; and it has been described by a crowd of pathologists during the two last centuries, whom it would be tedious to enumerate. Different views have at different times been taken of its nature,

according to the notions entertained of the nature of hydatids generally. Some have considered the vesicles of the vesicular mole as mere *bullæ* formed by thickened mucus or *pituïta*, others as peculiar products of the cellular tissue, others as disorganized glands, others as dilatations of the extremities of the blood-vessels, and others as varicose dilatations of the lymphatic vessels. The greater number of pathologists who hold these discrepant opinions agree, however, in considering the vesicular mole a degeneration of the embryo,—a disease of the impregnated ovum. Of the older authors the most instructive as to facts and the most precise in his notions of its nature and origin is *Valisnieri*; who says he ascertained by the microscope that the lymphatic vessels of the placenta, chorion, amnios, and umbilical chord have attached to them an infinity of little globules, and terminate at their ultimate ramifications in the same kind of structure; and he conceives that the vesicular mole is the product of these globules or pouches enlarged by diseased action.* Very recently the late *Professor Desormeaux* has taken the same view of its nature, founded on similar microscopic observations by *Velpéau*, who remarked “in the ovum when four or six weeks old, that a multitude of ramifications presented at their extremities abrupt enlargements of a round or oval form and vesicular appearance, and likewise a number of dilatations of the same kind in their course,—so as to exhibit the appearance of a cluster of currants.”† This opinion is in a certain degree confirmed by the circumstance that the same vesicular bodies, resembling hydatids, have been found attached to the placenta or to the membranes in cases of miscarriage or even sometimes of delivery at the full time, where the foetus had not been blighted. *M. Percy*, however, took a different view of the nature and origin of the vesicular mole. He considered it to be nothing else than a cluster of hydatids, or of the animalcules which *Pallas* first designated by the term *Tænia hydatigena*, by which they are now commonly known; and he brought forward what appeared satisfactory evidence of the accuracy of this opinion, by stating that he had on two different occasions seen the vesicles distinctly move immediately after their discharge, and remarked an extraordinary agitation among them when the cluster was subjected to the action of a solution of salt and vinegar.‡

Madame Boivin, who, in addition to a full abstract of our previous knowledge, has given two excellent cases which came

* *Valisnieri*, Storia del Parto Vesicolare. Opere, &c. ii. 1710.

† Dictionnaire de Médecine, xv. Art. *Ceuf*.

‡ *Corvisart's Journ. de Médecine*, xxii. 197.

under her notice, denies the facts and controverts the opinion of *Percy*; and returns to the old opinion, that the vesicular mole does not consist of hydatids, but is a degeneration of the impregnated ovum. In further confirmation of this she adds the authority of her experience to the fact previously stated by former pathologists,—that the whole clustered mass is enveloped in a general membranous sac, consisting as she found of two distinct layers, the outer one of which bears the closest resemblance to the *epichorion* or *decidua reflexa* of the embryo, while the inner one differs in no respect from the amnios. This structure has not been oftener observed, as she very correctly hints, because the membranous bag generally bursts while in the uterus, and the vesicles are discharged in fragments. But in one of her cases she had an opportunity of examining it carefully, as the whole mole was discharged in a single mass and surrounded by its membrane.

Having thus examined the nature, origin and structure of the vesicular mole, she proceeds to discuss the symptoms, the treatment, and the relations which the disease bears to medical jurisprudence.

The *Symptoms* are extremely obscure. *Percy* conceived that the disease might be distinguished from pregnancy, to which it bears an extremely close resemblance, by the rapid growth of the tumour of the pelvis in the early months, by the flatness of the upper surface of the tumour, by the alternate discharge of serum and blood after the second or third month, by the *os uteri* being always more or less open, and by the occasional discharge of vesicles, or, as he considered them, hydatids. But *Madame Boivin* calls in question the accuracy of the most important of these criterions. The alternate discharge of a serous fluid and of blood is, according to her, far from being constant, and besides occurs in other diseases and at times even in true pregnancy; the *os uteri* is by no means always, but rather rarely, open, till the mass is on the point of being discharged; and the most unequivocal sign, the escape of a few vesicles, is never observed till very soon before the discharge of the whole. The symptoms she lays down are,—at the commencement the usual signs of impregnation,—afterwards enlargement of the uterus, felt in the hypogastrium and increasing sometimes rapidly, sometimes slowly, as in true pregnancy,—occasionally profuse salivation,—commonly swelling of the mammae and brownness of the areolæ of the nipples, with the formation of a few drops of milky fluid in the nipples,—sometimes an alternate discharge of serous fluid and blood from the vagina,—and the want of the signs of a fluid in the uterus or of a solid body floating in a fluid, when the patient is subjected to the

operation of the *toucher*. This last sign, when united with the general phenomena of pregnancy, she considers nearly characteristic of the disease.

As to the symptoms of the delivery of a vesicular mole, she maintains that they are quite undistinguishable from those of the delivery of a foetus in the early months. The state of the os uteri and vagina is the same, the discharge puts on the same appearance as the lochia, there is usually feverishness, the breasts swell, and milk is secreted in them.

The *Treatment*, so long as the nature of the disease is not unequivocal, must be confined in a great measure to the means adapted to arrest or lessen the uterine hemorrhage, which is often dangerously great. The various means which have been proposed to hasten the expulsion of the diseased mass by irritating the uterus, or attempting to soften or dilate its mouth, have failed in her hands. Forcible dilatation of the os uteri she has never dared to employ. After the discharge of the vesicles has begun, *Percy* found great advantage from injecting a solution of salt and vinegar into the uterus; which was followed by a rustling sound in the pelvis,—owing as he supposed to the agitation of the hydatids under this unusual stimulus,—and by the speedy discharge of the whole remaining mass. But *Madame Boivin* doubts the efficacy and propriety of this practice. In one of her cases it was of no advantage; and in the other it occasioned violent pain in the uterus and intestines, which lasted several days, and made her dread the approach of inflammation. She considers titillation of the os uteri with the finger, stimulant injections into the rectum, friction on the hypogastrium, and the application of cold to the lower part of the trunk, both more efficacious and more safe. Stimulant injections into the uterus, however, are useful afterwards in case it does not contract readily, or when hemorrhage continues notwithstanding its contraction. The subsequent treatment does not differ from that of ordinary delivery.

In its *Medico-legal Relations* the vesicular mole is regarded by *Madame Boivin* as more important than by any previous obstetric writer. She considers it invariably the effect of sexual intercourse, which is the natural consequence of her doctrine respecting its nature. The young *Religieuse*, therefore, whom *Percy* acquitted of the charge of incontinence on the ground that vesicular moles are mere hydatids, unconnected with sexual intercourse, would not have made so easy an escape in the hands of the authoress of this work.* *Madame Boivin* farther considers, that it is in every instance extremely difficult and sometimes scarcely possible to distinguish between an enlargement of

* *Corvisart's Journ. de Médecine* xxii. 198.

the uterus from a vesicular mole, and an enlargement from a fœtus. This is a most important consideration in regard to cases of disputed pregnancy. And lastly, she expresses a still more decided opinion that the effects of the discharge of a vesicular mole cannot be distinguished from recent delivery in the early months of pregnancy, by any examination of the female. Hence if it were not on the whole a rare disease, it would in some circumstances be an insuperable obstacle to a positive inference in favour of recent delivery from physical signs.

We shall conclude our notice of this essay with an abstract of one of the cases related by the authoress.

Madame Claire, 28 years of age, of a delicate constitution, and sanguine temperament, menstruated regularly after her fifteenth year, and never had fluor albus. In the second year of her marriage she first became pregnant, and in the course of six years had three other pregnancies. The first child was born at the full term, and easily; but she had much flooding and considerable fever afterwards. The second and third were born easily at the full term, and without any accident supervening. In August 1825 she became pregnant, as she supposed, for the fourth time: She had all the symptoms which accompanied conception and the first three months of pregnancy on the three previous occasions. At the end of the third month the uterus was of the usual size at that period of pregnancy; its cervix was long, very low, and directed backwards; and its mouth was closed. At this period she had for the first time slight hemorrhage from the vagina, which returned during the subsequent month.—At the end of the fourth month the fundus uteri was inclined to the left side, and scarcely rose above the pubes; when examined by the vagina it was found to form a compact mass, tender to the touch, without any indication of a fluid, or of a moveable body within it; and at the same time the neck of the uterus continued very long and soft, rested on the perinæum, and was bent on itself, so that the os uteri presented forwards. During the preceding month the patient had become emaciated and anxious, and the hemorrhage frequently recurred, but she had no serous discharge at any time. At the end of the fifth month little change had taken place. A fortnight afterwards the uterus had advanced a little higher in the abdomen, and the breasts became swelled and tender. At the end of six months the state of the uterus was nearly the same; but the patient's general health was improved, and the hemorrhage was less frequent. In seven months the enlargement was obviously greater, yet did not exceed that of a fifth month's foetal pregnancy; and the tumour continued hard, incompressible, and tender. The neck of the uterus was thicker than before, and no longer bent. The hemorrhage had not recurred for several weeks. At the end of the eighth month the uterus began to contract, with severe pains and the re-appearance of hemorrhage; the cervix was very long, but also very thick; the os uteri was open, and a soft body with a granular surface could be felt at it. This was the peduncle of the vesicular cluster, which is always round

near the orifice of the uterus. At each labour-pain a little florid blood was discharged, but no change appeared to be produced in the passages. An injection of vinegar and brine into the rectum was followed by violent pain in the loins, and increased pain in the uterus; when at length, after the labour had lasted twelve hours, a vesicular mass as big as the fist was expelled from the vagina; and this was followed by the discharge of the remainder, which in size equalled the head of a full-grown fœtus. The first portion being kept near the vulva till the remainder appeared, the whole was preserved in one mass, enveloped in its double membrane, and weighed two pounds nine ounces. A portion of it was immediately subjected to the tests mentioned by *Percy* of the vitality of the vesicles. But no motion could be detected; not even the slightest quivering.

Violent after-pains succeeded the discharge of the mole, and continued till the fourth day; a lochial discharge gradually formed: fever appeared without any precursory rigor; the breasts swelled, and milk was secreted in them. In eleven days the neck of the uterus continued large, and its orifice wide enough to admit a small apple, just as on the second day after a natural delivery at the full period of utero-gestation. Stimulant injections being then resorted to, clots of blood were discharged; but the cervix and os uteri regained their proper dimensions very slowly.

The vesicular mass was afterwards carefully examined. It had a reddish appearance, but no visible red vessels. Its central nucleus, or peduncle, was about two inches in diameter. Its vesicles were some of them of the size of grapes, others extremely small. They contained a clear, somewhat viscous, thready fluid. Some of them had a whitish granulated appearance on their surface; and others presented the appearance of small vesicles attached to them like buds. When examined with the microscope, they were seen to have a double membrane, in the substance of which several white vessels could be distinguished passing from one to another, and ramifying within each. When one of the footstalks was examined between plates of glass, several of these vessels were seen, and one of them terminated on the membrane of the footstalk in little knobs or bulbs, which were apparently the rudiments of new vesicles. This vascular disposition of the footstalks is obviously the medium of communication between the vesicles.—P. 31.

The second work of *Madame Boivin* will not detain us long. It consists, properly speaking, of four unconnected essays,—the first of which is on a New and Common Cause of Miscarriage,—the second on Diseased Enlargement of the Ovaries as an affection often mistaken for Pregnancy,—the third on Excision of Enlarged Ovaries,—and the last on a New Pelvimeter.

The substance of the first essay is contained within narrow compass. But the cases which illustrate her views, and which are in general very apposite and interesting, occupy a considerable

able part of the volume. She conceives that a common cause of miscarriage is pre-existing organic derangement of the uterine appendages,—of such a kind, that although in the unimpregnated state the health does not necessarily suffer, yet after impregnation the uterus cannot expand itself freely as the foetus grows, without the parts being subjected to painful dragging and consequent irritation. The most frequent organic derangement of this nature is simple adhesion of the uterine appendages to the uterus itself, to adjacent organs, or to the peritonæum of the pelvis; and another variety of disease to which the authoress imputes the same effects is an indurated or tuberculated condition of the ligaments of the uterus. In any of these states of the organs of generation, as soon as the uterus has attained a certain size, corresponding in general with the fourth month or thereabouts, it cannot increase any farther, so as to rise out of the pelvis, on account of the rigidity of its ligaments, or the adhesion of its appendages to the uterus, the pelvic viscera, or the parietes; it is therefore subjected to more and more violent irritation, till at length it is stimulated to contract, and throws off the ovum contained in it.

This view of the cause of miscarriage in such cases is founded partly on the dissection after death of individuals who died soon after miscarriage, and in whom it was quite evident that the diseased state of the uterine organs must have existed long before,—and partly on instances of recovery from frequent miscarriages, where the diseased state of the uterine appendages was detected by an examination of the living body. The characters remarked during life are, according to the authoress, sufficiently precise. They are resistance of the uterus to an impulse communicated by the finger applied on the os uteri, unnatural immobility of the uterus when an attempt is made to move it by means of the finger in the rectum, sometimes the obvious discovery of organic disease on an examination by the rectum, great tendency to constipation, and, lastly, in a few cases unusual proximity of the os uteri to the perinæum, conjoined with the character already mentioned, the impossibility of pushing it upwards.

The following cases will serve to exemplify the affection which *Madame Boivin* describes. The first is a case of death from miscarriage in the fifth month of pregnancy, the cause of death being united inflammation of the peritonæum and suppurated tubercles in the lungs.

A widow, 27 years of age, tall in stature, moderately plump, and of a lymphatico-nervous temperament, was delivered of her first child with the forceps, after being sixty hours in labour; and had afterwards two children born at the full time, and naturally. She

was all this time poorly lodged, her living was indifferent, and her manner of life was very sedentary. In February 1826, she was attacked apparently with violent peripneumonia; and after this had existed some days, she miscarried in the fifth month of her fourth pregnancy. Three days afterwards she was admitted into the *Maison Royale de Santé*; but the affection of the chest made rapid progress, and proved fatal in six days more.—On dissection, the pleura was found every where adhering; the right lung contained a cavity as big as the fist filled with purulent matter; and the left lung was studded with tubercles of various sizes, some of which had passed to suppuration. The stomach and intestines were red, the peritonæum redder and thicker than natural, and its cavity contained some yellowish serum. The broad ligaments, the Fallopian tubes and the ovaries were agglomerated and attached to the posterior surface of the uterus by adhesions of such strength, as to require the scalpel for their destruction. In the substance of the agglomerated textures were remarked numerous tubercles between the size of a millet-seed, and that of a pea, and quite analogous to those found in the left lung.—“It is evident,” adds the authoress, “that with such a state of the uterus and its appendages, this organ could not develop itself but with great difficulty. Abortion would undoubtedly have taken place even though the chest had been sound. For the ligaments could not have yielded to the expansion of the organ to which they were firmly attached; and their resistance becoming the source of uterine irritation, contractions of the womb and the expulsion of the fœtus were the inevitable consequences.” P. 3.

Several other instances of the same kind are related. The only other case we shall notice particularly is one of those where the tying down of the uterus within the pelvis was recognized during life, and considered to be the cause of the frequent miscarriages which the patient had experienced.

Madame E., 26 years of age, stout in constitution, and of a lymphatico-sanguine temperament, had her first menstrual discharge at the early age of seven, and after her tenth year had it regularly. At thirteen she had an attack of menorrhagia; at fourteen she was married; in her sixteenth year she had her first child at the full time, and safely; and in her eighteenth she sustained a fracture of the left thigh-bone. After her twenty-third year she had three miscarriages in a year and a quarter, at the fourth, second, and fifth months. Then the catamenia became very irregular; and she had another violent attack of menorrhagia, followed by acute pain in the right iliac region, much vomiting and considerable fever; for which leeches on the belly, poultices, and anodyne injections were required. In two months more she had a similar attack, when the state of the genital organs was for the first time carefully examined. The uterus was found so low as almost to rest on the perinæum; its cervix was larger than natural, and tender; the *os uteri* was open, and surrounded by a

circular collar formed by a fold of the upper end of the vagina ; and the uterus could not be forced back but with great difficulty, nor without occasioning acute pain in the left haunch and groin. The same treatment was followed as in the former attack ; and in order to combat the obstinate constipation to which she had been long liable, emollient and purgative clysters were used, though for some time unsuccessfully. A temporary improvement was thus procured ; but the symptoms recurred again with violence, and were not permanently removed till she underwent a mercurial course. In this case every circumstance announced an organic derangement in the internal organs of generation of very old standing. This appeared from the premature menstruation, her liability to menorrhagia, and her frequent miscarriages. The symptoms of enteritis might also suggest the probability of adhesions between the uterus and intestines.—P. 44.

In cases of the affection here described, the cause of the organic derangement of the organs of generation has sometimes obviously been inflammation of the pelvis ; but in the greater number it has arisen without any distinct symptom to mark the source or time of its formation. Cases of the latter description have appeared to the authoress to occur chiefly among females with dark hair, blue eyes, and particularly bluish sclerotics, and who have led in their youth a sedentary life, with habitual neglect of the bowels. Indeed she is inclined to trace the disease in a great measure to habitual constipation. She thinks a course of mercury has sometimes proved effectual in removing the organic disease, or at all events in rendering the female capable of carrying her child to the full time ; and conjectures that in the instances where Dr Granville thought he succeeded in removing by mercury a tendency to miscarriage, the tendency must have been owing to the disease now described.

The second Essay in this volume consists of a selection of ten extremely interesting and well-told cases, where Tumours of the Ovaries were mistaken for Pregnancy. In many respects they deserve the careful consideration of the pathologist, the accoucheur, and the medical jurist. It is impossible to convey a just idea of this paper by any abstract ; because its excellence consists simply in the accuracy and fullness of a set of cases, which possess few features in common, and cannot therefore be comprehended in a general summary. We shall be content with giving the leading particulars of a few of the cases,—taken at random,—for they are all equally valuable and nearly complete. The first we shall mention is a case of ovarian dropsy, which proved fatal a month after the fluid was withdrawn by an aperture made from the vagina.

A married female, 26 years of age, had a child in her seventeenth year, but never became pregnant again. In her 21st year, she had an attack of inflammation in the lower belly, after which she was never free of pain in the left iliac region, extending towards the right, and accompanied subsequently with a little tumour in the right groin. The catamenia, however, continued regular, her health good, and her habit of body rather full. In December 1825, the pain in the right ilium extended throughout the pelvis, the hypogastrium began to enlarge, and the patient was affected with frequent nausea and vomiting, which complaints were only temporarily relieved by the warm bath, general and local blood-letting, and anodyne injections. At length, the tumour continuing to increase, her physician came to the opinion that she was pregnant; in May, another physician, who was consulted, gave his opinion, that she had an extra-uterine pregnancy; in July, the family attendant thought he felt the tumour harden while the fits of pain were severe; he even conceived he felt the cervix uteri developed, the lips of the os uteri attenuated, and the os uteri beginning to dilate; and the patient herself was convinced she felt the movements of a foetus. The catamenia, however, were regular.

About this period she entered the *Maison de Santé*, where the authoress and *M. Paul Dubois* examined her, and came to the conclusion that she was not pregnant. They found the cervix uteri drawn towards the right side, and almost covered by a fold of the vagina,—the os uteri nearly of the natural size,—the body of the uterus undiscoverable by the rectum, and in its place a large tumour lying across the pelvis,—the enlargement of the abdomen apparently caused by two tumours, of which the upper was the larger and presented evident fluctuation. The operation of tapping being determined on, *M. Dubois* performed it by the vagina, and removed twenty pounds of a thick matter like *bouillie*. After this the uterus could be felt through the rectum, and it was of its natural size. Of the subsequent history of the case no further particulars are given, except that she died a month after the operation.

On dissection, an immense cyst was found occupying the whole abdomen, and adhering to the lower surface of the liver, as well as the right abdominal parietes. The uterus was somewhat larger than natural, but otherwise healthy. The base of the tumour consisted of a compact mass of hydatids, tubercles, and detritus of these substances; and the inside of the cyst was lined with tubercles. The left ovary could nowhere be seen, and the Fallopian tube of that side was unusually long and large, having followed the tumour as it grew. The right ovary was twice the natural size, and contained a reddish cyst scarcely so big as a pea, and the corresponding Fallopian tube was natural.

The second case we shall notice, is an extremely interesting example of the spontaneous cure of an ovarian dropsy.

An unmarried female, whose catamenia had always been regular from the age of thirteen, was attacked with suppression

when she reached her twenty-fourth year, three months afterwards, with acute deep-seated pain in the right side of the abdomen, and successively with gradual enlargement of the belly, swelling of the right side of the body, and difficult micturition, so that she required the regular use of the catheter. Leeches, blood-letting, a course of various mineral waters, and cold bathing were successively resorted to, without any advantage. For a long time her parents were convinced she was with child. At last, when her illness had lasted three years, she felt, while she was making an effort to get into bed, as if something had given way in her body; and immediately a great quantity of a greenish and very fetid liquid gushed from the vagina. This discharge continued for five or six days, and was succeeded by slight hemorrhage; after which she gradually got quite well, the catamenia returned, and she rapidly gained flesh again.

Two years afterwards, the pain returned in the right iliac region, the menses became again suppressed, the right flank was found to be very full, the cervix uteri was natural, but inclined to the left side, and through the vagina a firm moveable tumour could be felt, which corresponded with the fullness in the flank. The application of leeches and the hip-bath removed the pain, and the catamenia returned at the next period. The fullness in the right flank had existed from the time the fluid was discharged by the vagina, and was obviously a tumour of the right ovary, or of the general uterine appendages of that side.

The next case is one of a very rare and singular description, where the patient was believed to be pregnant, and at the end of nine months was relieved of her burden by the discharge of blood from the vagina, and recovered her health entirely. The nature of the case is not quite clear; but *Madame Boivin* states positively that the uterus could be felt in its natural state; so that it is difficult to conceive how the disease could be any thing else than an accumulation of blood in the ovary.

A married female, who had a child in her sixteenth year, and was married a second time when she was twenty-four, but without becoming again pregnant or having her catamenia disturbed for eight years, was at length affected with suppressed menstruation in the year 1810. The ordinary symptoms of impregnation immediately appeared,—anorexia, nausea, vomiting, frequent syncope, and progressive enlargement of the belly; and these symptoms continued for nine months, at the end of which period pains like those of commencing labour made their appearance. An accoucheur was sent for, who was led to expect a speedy and natural delivery; but several days passed on without the supposed labour making any progress. At length blood began to gush in torrents from the vulva, the fits of syncope became more and more frequent, and during a fit, which was longer than the rest, the accoucheur

vanished. *Madame Boivin* being sent for, she found the patient bathed in her own blood; and on making an examination by the vagina, discovered the os uteri in its natural state, and the uterus small, moveable, and without any sign of having recently emptied itself. The right side of the abdomen continued tumid, but was soft. A tight bandage was immediately applied, and all the customary means resorted to for checking the hemorrhage. Blood, however, continued to ooze from the vagina for several days; but it was impossible to discover where the blood entered the vagina. The patient's strength gradually returned, and she soon got quite well, with the exception, that slight pain was occasionally felt in the right flank, and the catamenial discharge was ever afterwards irregular. She remained under *Madame Boivin's* observation for thirteen years after this singular accident, during which she had no return of it, neither was she ever again pregnant.

The last case we shall mention is very striking in a medico-legal point of view. The patient, in consequence of the sudden discharge of the fluid of an ovarian dropsy, was suspected of having violently procured her own miscarriage; and her innocence was not known till, during a return of the ovarian disease, she died of extravasation on the surface of the brain.

This person, a cook, 30 years of age, was found in a state of complete apoplectic stupor early in the morning. She had been for some months in a state of great melancholy, and was therefore suspected of having made away with herself, more especially as she was supposed to have been pregnant the year before and to have got rid of her pregnancy by violently procuring miscarriage. Her sister, without either denying or assenting to this charge, said she was aware she had been long irregular in her menstrual flux; that her belly had at one time been very large, and had suddenly become of the natural size; that subsequently she had been seven months without any appearance of catamenia, during which the belly again enlarged; and that for eight days she had had constant hemorrhage, with the effect of diminishing the size of the abdomen.

On examination the belly appeared smooth and without any mark of previous great distension. The finger being introduced with much difficulty into the vagina, the uterus was found very low, very small, lying across the pelvis, and with its orifice much elevated towards the right side. It was obvious that the woman neither was pregnant, nor had been lately delivered.—Blood-letting and sinapisms to the feet procured some transient improvement in the apoplectic symptoms; but she died on the evening of the same day on which she was discovered insensible.

On inspection of the body the cerebral membranes were found much injected, and blood was extravasated among the convolutions. In the abdomen two tumours were seen, each as large as the head

of a nine-months' foetus; one was formed by the enlargement of the left Fallopian tube, the other at the expence of the ovary of the same side. The cyst of each was a fibro-membranous expansion, a line and a-half thick; its inner surface was studded with small, whitish, hydatoidal excrescences; and each contained about a pint of yellowish-red fluid of the consistence of honey. The right ovary was as big as a hen's egg, wrinkled and plaited, as if it had been distended and had contracted again; and it contained a yellowish-white, puriform matter. The uterus was fifteen lines long, and an inch in breadth at its widest part. The *os uteri* was gaping and without any appearance of cicatrices.

Cases like these now related may, according to *Madame Boivin*, be generally ascertained by the examination of the uterus through the vagina and rectum. Sometimes the *os uteri* is in its customary situation; but much more generally, in consequence of the disease affecting but one ovary, the fundus of the uterus, during the early period of the growth of the tumour, is thrown across the pelvis to the opposite side; and hence the *os uteri* is felt opening very much to one side, while the body of the uterus may be felt occupying an oblique position across the pelvis.

The two remaining papers in this volume do not require particular notice. The third is an abstract of several cases which have been published in various British, American, and Continental journals of that most barbarous, unscientific, and unprofitable operation,—the removal of the enlarged ovary by ripping up the belly. If, after the lamentable failures which have taken place in the hands of those who have had the audacity to attempt this operation, any one still thinks it justifiable, we may refer him to a short view of the objections to it stated in the Lectures of Mr Lawrence, as reported in the *Medical Gazette* for August last. The fourth essay consists of a description of a new Pelvimeter, which appears well enough devised for its purposes, so far as they can be attained by any instrument of the kind; but as any account of it would be unintelligible without the drawing and a full description, we must refer the curious reader to the original.

ART. V.—*A Treatise on the Venereal Diseases of the Eye.*

By WILLIAM LAWRENCE, F. R. S. late Professor of Anatomy and Surgery to the Royal College of Surgeons in London; Surgeon to St Bartholomew's Hospital, and Lecturer on Surgery at that Hospital; Surgeon to Bridewell and Bethlehem Hospitals; Consulting Surgeon to the London Fever Hospital; and late Surgeon to the London Ophthalmic Infirmary, &c. &c. &c. London: Printed for John Wilson, Princes Street, Soho. 1830. 8vo. Pp. 337.

THE venereal diseases of the eye Mr Lawrence refers naturally to two heads, gonorrhœal and syphilitic, according to the nature of the poison from which they are supposed respectively to originate.

The existence of the first of these forms of ophthalmic disease has been overlooked by some and doubted by others; and the first object of the author after describing its phenomena and effects, is to show that gonorrhœal ophthalmia is not a creature of imagination only. Nothing, indeed, can be more shocking than the rapid progress of this disease, and the destructive ravages which it exercises on the organ of vision. Affecting solely the mucous surface of the eyeball and eyelids, which become red, villous, swelled, and secrete thick purulent fluid, it very soon spreads to the cornea, which it either renders so thick and opaque as completely to impair vision, or destroys its texture, and, after inducing either ulceration or sloughing, or both, causes it to burst in a very short time. In the course of the process the mischief consists in the difficulty of either observing or knowing what is going on within the eye. The surgeon sees nothing but two enormous, red, swelled eyelids, with thick yellow purulent fluid oozing from between them, the upper one particularly large, and almost brown or blue with congestion, occasionally everted and exhibiting a red thick villous surface like that of the rectum or vagina, and most completely covered by purulent matter. If any attempt is made to inspect the eye by everting or separating the eyelids by the speculum or the fingers, and in doing so the utmost caution should be observed, lest the fluid be spirted into the organs either of the surgeon or his attendant, the cornea is almost invariably invisible; and nothing is seen but a red elevated mass of fleshy matter, with a small round hole in the centre. This the uninitiated is apt to imagine a hole in the eye; and he thinks the descriptions of those who speak of the eyeball bursting are realized. The adept,

however, knows that the appearance now mentioned is what is named *chemosis* in an extreme degree, and that it results from the extreme tumefaction of the conjunctiva and its submucous cellular tissue, which thus causes it to project all round the centre of the cornea, leaving there a circular chasm, corresponding to its circular attachment to the margin of the cornea.

This tumefaction, every good pathologist knows, is occasioned by the excessive injection of the vessels of the conjunctiva, and its subjacent cellular tissue, with more or less interstitial deposit of lymph, and not as Richter, Beer, and most of the continental ophthalmologists think, by deposition or effusion of gonorrhœal matter. This absurd fancy, which is manifestly a remnant of the humoral and metastatic pathology, and which still pervades the writings of many of our continental friends, is treated with becoming contempt by Mr Lawrence. It is readily refuted by the fact that the swelling occurs in severe ophthalmia, especially purulent, whatever be the cause, and that the interstitial effusion is not purulent, but serous, or sero-albuminous. Whatever be its origin, it is easy to see that it must cause most excruciating pain; and, indeed, the burning heat of the eyeball is immensely aggravated by the piercing and tearing sensation which so large a mass of newly formed matter causes.

Meanwhile the morbid action spreads and assumes greater intensity. Mr Lawrence distinguishes it into three stages, the first characterized by vascular distension, and swelling of the membrane and eyelids; the second by the appearance of the puriform discharge; and the third by the extension of the disease to the cornea. But he does not attempt to specify the duration of each of these stages, which necessarily varies in every case; nor does he trace their transition into each other, farther than by saying, that the immediate effects of the inflammation in the cornea are sloughing, suppuration, ulceration, and interstitial deposition, and that these in turn are followed by escape of the humours and collapse of the globe, obliteration of the anterior chamber, and flattening of the front of the eye, staphyloma, prolapse of the iris, obliteration of the pupil, corneal opacity, and anterior adhesion of the iris. The *bursting* of the cornea he seems inclined to doubt, or at least to explain it otherwise; and indeed it cannot be properly denominated bursting, since the rupture is always preceded by sloughing and ulceration of the cornea. The structure of this part of the eye is such, that the commencement of injury is most frequently death of a portion of it; and this result is rendered much more certain in this instance by the peculiar strangulation which the surrounding ring of vessels at the margin of the con-

junctiva necessarily undergoes. Death of a portion of the cornea is quickly followed by ulceration or rather forcible laceration of the dead part, which is thick, opaque, and leathery, from the living; and in this manner the aqueous humour escapes; the iris is protruded and strangled; the inflammation extends from the iris to the ciliary circle and processes, and the other internal tunics; and the eyeball is irreparably injured.

The description of the appearance of the cornea before the extinction of its vitality and of the changes by which this event is followed given by Mr Lawrence is very accurate.

“ The cornea becomes dull and hazy before it sloughs, or indeed before undergoing any of the changes just enumerated. Its transparency and polish are completely destroyed, when it has sloughed; and it is converted into a dirty yellowish or brownish opaque substance, which is immediately recognized as deprived of life. At first it looks like a portion of wetted leather; it is soon separated from the living parts, when it has a loose, soft, and ragged appearance. As the lens and capsule, which are exposed by this separation are transparent, the patient sometimes recovers, for a short period, tolerably good vision. After the slough is detached, the chambers of the aqueous humour may be exposed by ulceration; the humours will then escape, the emptied coats will collapse, and the globe remains permanently shrunk in the socket. More commonly, although the whole cornea seems to slough, the entire thickness does not separate, and the anterior chamber is not exposed. The interior layer of the cornea, or the membrane of the aqueous humour, is left, and is soon pushed forwards by the iris, which forms an irregular, brownish, and dirty-looking protuberance in the front of the eye. As the inflammation declines, this protuberance recedes, until it disappears altogether, the front of the eye remaining flattened, and being formed by the iris, covered by a thin, smooth, and more or less opaque pellicle, through which the fibres of the iris may be partially seen, giving it a somewhat streaked appearance. Sometimes the iris is permanently protruded, and forms a dark, more or less smooth protuberance, partially subdivided on the surface, (*Staphyloma racemosum*.)

“ The separation of the slough, when it has been partial, leaves an ulcerated surface, which is soon raised into a vesicular protuberance, consisting of the membrane of the aqueous humour, with the iris, which has become adherent during the previous inflammation of the cornea (*prolapsus iridis*.) This shrinks as the inflammation declines, and the regular figure of the cornea is restored; but the iris remains adherent, and is covered only by a thin pellicle, which is partially opaque, while the boundary of the adhesion presents a deeper opacity in the cicatrix of the corneal laminae. This process is exemplified in Cases VIII. and IX. If a considerable portion, such as one-half or one-third of the cornea, should have perished, a permanent tumour is sometimes formed in

the front of the eye, consisting externally of the opaque cornea, and internally of the adherent iris; its cavity, which is an extension of the anterior chamber, being filled with aqueous humour: this is termed partial staphyloma, and differs from prolapsus iridis, or complete staphyloma, only in size. I have seen it occur in both eyes of the same individual, with but little injury to sight, as the protrusion of the iris hardly interfered with the pupil.

“Suppuration of the cornea may be general or partial: it is usually the former. The cornea first becomes white, and then assumes a yellow colour. The effused substance is not a fluid, nor is it collected into a cavity; it is a thick viscid matter deposited in the texture of the cornea. Ulceration takes place, and exposes an opaque yellow substance, which looks like ordinary matter, but it cannot be wiped off. The ulcerative process extends until this is removed. If the whole cornea should be destroyed, the humours may escape, and the globe will shrink. Or, the humours may remain, and the tumid *conjunctiva scleroticæ* contract from the circumference towards the centre of the space left vacant by the cornea, until it completely fills that space, when the eye appears like a red fleshy mass, in which even the original situation of the cornea cannot be distinguished. The ulceration of the suppurated cornea may penetrate the anterior chamber at different parts, at each of which the iris may protrude, the front of the organ remaining ultimately flattened.

“When ulceration takes place without previous suppuration, it generally attacks the margin of the cornea, and extends rapidly through the laminae, so as to form a deep trench, seldom occupying less than one-third, often one-half or two-thirds of the circumference, and sometimes extending round the whole circle. In the latter case, the portion insulated by the ulcerative process sloughs. On the sides of this ulcerated trench, the laminae of the cornea may be often seen very distinctly. Beer says that they turn up like the leaves of a book, which has been much read. If the ulceration should not occupy more than two-thirds of the margin, the vascular supply of the cornea will still be carried on, and the mischief may be repaired. As the margin of the cornea is covered by the swollen conjunctiva, these ulcers are at first concealed from view, and we do not know of their existence until the chemosis begins to subside. When the ulcer has gone through the corneal laminae, the membrane of the aqueous humour may rise as a transparent vesicle in the cavity; or it may be pushed forwards by a protruding portion of the iris. The ulcerative process may penetrate the anterior chamber, when the iris will either fall against the opening, or be pushed into it and block it up. If the ulcer, whether it should have arisen from the separation of a slough, or have occurred in the manner just described, should be spreading, the inflammation remaining unchecked, its surface is whitish, and ragged, or flocculent; or of a dirty yellowish cast, with surrounding haziness. When the inflammation subsides, it becomes transparent. The commencement of the restorative process is marked by the surface of the excavation assuming a light greyish tint, with jelly-like ap-
3

pearance. A soft semi-opaque substance slowly fills up the breach, when the surface becomes smooth, and the regular figure of the cornea is restored. No secretion of pus is observed, either during the stage of ulceration or that of reparation; the latter process is slow, several days often elapsing without any sensible change in the size or appearance of the ulcer. The same process of contraction takes place here, as after the cicatrization of other ulcers, so that the size of the opaque cicatrix is much less than that of the previous corneal ulcer; and as these ulcerations take place on the circumference of the part, one that has been of considerable size leaves a mark that is only observable on close inspection, while, where the ulceration has extended over the edge of the pupil, the cicatrix may leave that aperture quite unobstructed."—Pp. 18–23.

How is this disease to be distinguished from purulent ophthalmia, the surgeon naturally asks? One of the best distinguishing characters is, that while purulent ophthalmia affects both eyes in general, gonorrhœal ophthalmia affects only one. Even this character, however, is ambiguous. Purulent ophthalmia may be confined to one eye, while the gonorrhœal disease may affect both.

The tendency of this disease is to destroy the organ; and the prognosis therefore promises nothing favourable. Of fourteen cases recorded by Mr Lawrence, in nine vision was entirely lost from sloughing, suppuration, or opacity of the cornea. In the other five vision was restored, though with corneal opacity, and anterior adhesion of the iris in three of the number. The degree of injury done to the organ depends on the extent to which the lesions of the cornea proceed. Ulceration may take place in it and be cicatrized; and even superficial sloughs may be detached without destroying its transparency; but when the cornea is perforated and the anterior chamber laid open, little hope of saving the eye can be entertained. When the iris is exposed, its anterior surface inflames and adheres, with obliteration of the pupil, its substance and the ciliary processes and lens are involved in the mischief, and the organ is irreparably destroyed.

The question of the cause of this disease is closely connected with its existence as an individual affection. Unless it can be proved to originate from the application of gonorrhœal matter, it cannot with justice be denominated *gonorrhœal ophthalmia*. Though the occurrence of ophthalmia, therefore, in the eyes of those labouring under *gonorrhœa*, could never be denied, several authors, and among others the late Mr John Pearson, never admitted the form of disease as resulting from the cause alleged. The soundness of this conclusion must be estimated very much by the personal experience of the witnesses; for it by no means follows that, because the disease was not observed by Mr Pear-

son to originate in the manner mentioned, it might not be observed to arise from this cause in the experience of others. We believe no one can doubt the fact, that many instances of purulent ophthalmia can be traced distinctly to the application of gonorrhœal matter. The following examples occurred to Mr Wardrop, and were by him communicated to Mr Lawrence.

“An old lady went into the dressing-room of her son, who had gonorrhœa, and washed her face with a towel which he had been recently making use of. Purulent ophthalmia quickly supervened, and destroyed the eye in a few days. A washerwoman, who had been employed in cleansing foul linen, was seized in a few hours with puriform ophthalmia, which terminated in the suppuration and collapse of both eyeballs. Delpesch,” continues Mr Lawrence, “mentions the instance of a young and healthy woman, who washed her eyes with goulard water and a sponge, which had been used by a young man affected with gonorrhœa. Violent ophthalmia came on, and quickly terminated in loss of the eye. Mr Bacot distinctly traced the origin of the disease to infection, by means of matter from another individual, in three instances, two of which were washerwomen.”—Pp. 32, 33.

In like manner, a careless young person who has caught gonorrhœa, foolishly applies to his face or eyes the same towel which he had been previously using in removing some of the urethral discharge, or drying the *glans* after applying some lotion; and in a few hours he feels the eye uneasy, rubs it, and thinks it has caught some dust. After some hours more, however, with increase of heat, itching pain and swelling, purulent secretion commences, and the disease is established, and may proceed very quickly to destroy the organ. Similar cases are given by Mr Lawrence. But it is remarkable that not in all cases is the puriform discharge of the urethra, when applied to the eyelids, followed by the puriform secretion from the palpebral and ophthalmic mucous membrane of the same individual. To produce the proper action, the secretion requires to be applied to the membrane and vessels of a different individual. This is accordant with the results of the experiments of Dr Veitch, who found that the matter of acute purulent ophthalmia applied to the urethra does not produce gonorrhœa in the same individual, but in a different person a most virulent disease.

It must not be denied, nevertheless, that in a large proportion of cases Mr Lawrence admits that it is impossible to trace the disease of the eye to the application of infectious matter either from the same individual, or the urethra in different persons. This circumstance might seem to favour the doctrine of metastasis, as maintained by RICHTER, SCARPA, and BEEB; but in none of the cases which have come under the observation of the present author has the urethral secretion been suppressed,—a

circumstance necessary to the probability even of this hypothesis. Conversely, Mr Lawrence has often witnessed the sudden cessation of the urethral discharge, without the supervention of ophthalmic disease; and he therefore infers that the latter event is entirely independent of the former, and is to be ascribed to some state of the constitution which, however, he does not attempt to specify. Gonorrhœal ophthalmia he thinks is as likely to have a constitutional origin as that form of disease which is connected with rheumatic and arthritic disorder, from which he believes it to differ in degree only; and perhaps it adds to the probability of this idea, that a particular form of gonorrhœal ophthalmia, viz. the metastatic, has a constitutional origin, that it appears to be confined to males only.

On the mode of treatment some discordance of opinion has prevailed. By one party, who maintain that it ought to be energetic in proportion to the rapidity and violence of the disease, depletion, general and local, to as great an extent as the patient's strength will admit, with every part of the antiphlogistic regimen, are represented as indispensably necessary to rescue the eye from the destructive ravages with which it is threatened. But it is mortifying to find that even these vigorous measures are by no means always adequate to attain the object proposed. Both in gonorrhœal and in ordinary purulent ophthalmia, indeed, several practitioners have had occasion to witness the inadequacy of the most prompt and vigorous use of the antiphlogistic system; and Dr O'Halloran especially in the former variety, after experiencing the inefficiency of copious general and local depletion, had recourse, with success, to the employment of very strong astringents, the sulphate of copper in substance, and nitrate of silver in solution. The efficacy of strong solutions of the latter agent, especially in gonorrhœal inflammation, has been known for a considerable time; and analogical considerations appear to have led to its use in the diseases of the eye by Dr Ridgway and Mr Melin. The solution employed by Mr Melin consisted of four grains of the salt in one ounce of distilled water; that employed by Dr Ridgway and Dr O'Halloran, consisted of ten grains of the salt in a single ounce of water; this the latter gentleman dropped into the eye, or he rubbed the inner surface of the eyelids with sulphate of copper; and he combined the use of purgatives and sedative fomentations.

On the efficacy of this mode of treatment Mr Lawrence is averse to give a positive opinion, from not having tried it to sufficient extent. In two cases only he informs us in a note, he used it with the best result; and he is inclined to think that, considering the rapidity of the disease, and the trifling influence exercised by the usual antiphlogistics, the caustic or astringent solution may be the best.

We are informed by Dr Shortt of this place, who has had occasion to treat the purulent ophthalmia on the most extensive scale, in the Military Hospitals of Egypt and Sicily, that he carried personally the depleting system of treatment to the greatest extent, to 60, 70, 100, and even 200 ounces, and often without the smallest effect in arresting the progress, or mitigating the severity of the disease. In many instances he informs us the cornea gave way and the aqueous humour escaped, though he had blooded the patient to fainting several times; and he has reason to believe, that the blood-letting was carried to an injurious extent. Pathologically and therapeutically gonorrhoeal ophthalmia is quite the same as the puriform epidemic disease; and the remedies which are beneficial in the latter promise also success in the former.

As an example of the inefficacy of even the most powerful and promptly used antiphlogistic measures in controlling this form of ophthalmia, we may adduce the following facts communicated by Dr Shortt. In the corps named the *3d Italian Levy*, of which, while stationed at Carini in Sicily, Dr Shortt had the charge, when purulent ophthalmia was prevailing at its greatest height, the ordinary practice was, with the active use of calomel purgatives, to detract from the arm or the temporal artery blood to the amount of forty or fifty ounces at once, to shave the head, and apply cold, and repeat the blood-letting, according to the strength of the patient, at intervals of three, four, or six hours. In severe cases, and in those in which the constitution allowed, 150 ounces were in this manner drawn. Here, therefore, there could be no want either of energy, of promptitude, or of extent, in the use of antiphlogistic measures. Yet in most of the cases, the cornea gave way, and allowed the iris to protrude; and the subsequent cessation of the disease depended not on the effect of the depletory measures, but partly on the bursting of the cornea, and partly in passing over a certain course. When the cornea burst in the centre, sight was in general irrecoverably lost. But if it gave way at the margin, adhesion occasionally was effected, the disease subsided, and vision was partially restored. In illustration of these facts, a young Italian of this corps, brought to hospital with purulent ophthalmia of both eyes, was immediately bled from the temporal artery to the amount of fifty ounces, had the head shaved, and was placed under the pump in the hospital-yard, where cold water was pumped on his head till he fainted. A strong cathartic was given, the cold *douche* was repeated in a few hours, and in the evening he was blooded to the same extent as at first. Notwithstanding the repetition of this treatment, as the strength of the patient could bear it, for twenty-four hours, both eyes burst. It was fortunate that the cornea gave way at the lower

margin ; for though the iris protruded in the meantime, adhesion took place, and the patient partially recovered his sight. Dr Shortt has farther had occasion to remark, that those patients who underwent the severest depletory measures were invariably longer in recovering sight than those treated with more moderation ; and in such subjects it was only when the constitutional powers began to rally, that the specks and opacities of the cornea began to disappear, and the ulcerations to heal. These unfavourable results led Dr Shortt with others to employ the nitrate of silver in solution with tonics and stimulants ; and since the adoption of this practice he has effected a much larger proportion of cures.

Of the mode of treating this disease, by attempting to restore the urethral discharge, though much recommended on the continent, we have little experience in this country. Its efficacy Mr Lawrence is disposed to question ; and when we remember what has been already stated on the relation between the appearance of the ophthalmic disease and the supposed suppression of the urethral discharge, it is impossible to question the justice of this scepticism.

Besides the puriform disease, the gonorrhoeal affection appears to induce inflammation of the external tunics and iris, without puriform secretion. The reason of this appears to be, that the conjunctiva is in truth slightly affected ; and, since the textures affected are not muciparous, they cannot assume the puriform secretion.

“ The inflammation soon extends to the iris, which loses its brilliancy, assuming a dull and deeper hue. The pupil contracts, and lymph is effused from its margin. The external redness is increased, the vessels of the conjunctiva being more distended. The cornea at the same time becomes hazy, and vision is more or less impaired. Nebulous opacity and speck of the cornea are sometimes produced. See Cases XV. and XXIV. As the inflammation subsides, the iris recovers its natural colour, and vision is restored.

“ If the inflammation be considerable, it may cause adhesions of the pupil, with contraction of the aperture ; and the adhesions thus formed are sometimes white as in arthritic iritis. Even permanent dimness of sight may be produced. Sometimes repeated attacks of the disease occur, each of which causes fresh adhesion, so that at last the pupils are fixed in their whole circumference and considerably contracted. This is exemplified in Case XVI. which also shews that the complaint is not always very serious, as the patient had escaped without any material imperfection of sight, although he had employed nothing but a wash in the several inflammations he had experienced.”—Pp. 53, 54.

For this affection the appropriate remedies are depletion, general and local, warm sedative fomentations, and the constitu-

tional influence of Plummer's pills, with aperients and regulated diet.

A variety of this affection is also observed to occur in the persons of several subjects, in connection with rheumatic or arthritic pains, all dependent on gonorrhœal discharge, or some of its effects. The mechanism and theory of this connection are not very obvious; and the fact itself might be called in question, were it not supported by the testimony of several competent and credible witnesses. Allowing these proofs to be satisfactory, Mr Lawrence makes the following observations on its intimate characters:—

“The affection of the eye last described is exactly the same as rheumatic inflammation of the sclerotica and iris occurring independently of gonorrhœa. Both this and the mild purulent inflammation of the conjunctiva are to be regarded as rheumatic affections of the organ excited by gonorrhœa; that is, they take place in individuals, in whom this constitutional disposition is shewn by inflammation affecting either the synovial membranes or the fibrous structures of several joints. Although the organs seem at first view very dissimilar, there is an analogy of structure between the parts which suffer in the two instances; that is, between the synovial membranes and the conjunctiva, and between the ligaments and fibrous sheaths, and the sclerotica. Hence we need not be surprised at finding that the eyes suffer under the influence of that unsound state of constitution, which leads to these affections of the joints. The structure originally affected, the lining of the urethra, is also a mucous membrane, which sometimes becomes inflamed, and pours out a puriform discharge, in gouty and rheumatic subjects, from internal causes. That the essential cause of this combination of morbid phenomena is peculiarity of constitution may be inferred from the repetition of attacks, and the length of time for which some individuals are harassed by successive appearances of disease in various parts.”—P. 57, 58.

These trains of morbid phenomena, however, Mr Lawrence is very far from ascribing to the gonorrhœal infection exclusively and entirely. The operation of this cause is neither uniform nor essential; and the production of the ophthalmic disease seems due to constitutional causes, the influence of which is occasionally excited by the presence of the urethral affection.

On the subject of *iritis* and internal ophthalmia, much of late years has been said and written; and we cannot agree with Mr Lawrence in thinking that this variety of syphilitic disease has been as much overlooked as the gonorrhœal ophthalmia. Independent of the observations of Travers and others, we beg to remind the author, that Mr Hewson of Dublin published in 1824 a Treatise on the History and Treatment of Ophthalmia accompanying the secondary forms of *Lues Venerea*, in which he

described, with sufficient amplitude and detail, the phenomena and effects of this variety of syphilitic disease. It is very true that Mr Hewson did not, to our satisfaction, prove that all the cases which he records, resulted from the operation of the venereal poison; and we then showed that a large proportion of these might, with equal justice, have been ascribed to the deleterious effects of the mercurial action; but, according to the common understanding of professional persons, the diseases which Mr Hewson describes are to be classed under the general head of venereal. An account of the observations of Mr Hewson, which is given in our 23d volume, p. 358, will show that this gentleman has at least had considerable experience in observing the progress and effects of internal ophthalmia in the persons of those who had laboured under venereal affections, primary and secondary, and for which more or less mercury had been exhibited. From these circumstances, the observations of Mr Lawrence on syphilitic ophthalmia possess less novelty than those on the gonorrhœal variety of the disorder; and we shall therefore hold ourselves at liberty to pass them over rather briefly.

After a general sketch of the phenomena of *iritis*, Mr Lawrence adverts to the change of colour which it undergoes, and the loss of brilliancy which it sustains, and describes the appearances assumed by the effused lymph in the following manner:—

“ The deposition of lymph takes place under various modifications in syphilitic *iritis*: 1st, Its effusion into the texture of the iris generally causes the changes of colour just described. 2dly, It may be deposited in a thin layer, covering a larger or smaller surface. In this way, the edge of the pupil first, and subsequently the lesser circle of the iris, assume a reddish brown or rusty colour in the beginning of the affection. The discoloured part has a rough villous appearance, when closely inspected, and we shall generally find, on careful examination, more particularly on looking at the part sideways, that slight elevation and irregularity of surface are produced by this new deposit. Sometimes the stratum of lymph has a light yellowish brown or ochrey tint, and a loose villous texture, rising into obviously prominent masses. The rusty colour is the most common, and is observed particularly in blue irides; the other is seen in the grey, or the mixture of grey and orange. This kind of deposit is generally confined to the inner circle of the iris; but the outer circle is usually, at the same time, more or less discoloured and dull. 3dly, The lymph may be effused in distinct masses, that is, in small drops or tubercles of a yellowish or reddish brown colour; sometimes they are of a bright red, and sometimes yellowish. They vary in size from that of a pin's head to a split pea. Often there is only one; there may be two, three, or more. They may be deposited on the edge of the pupil, or in any part of the

anterior surface of the iris. When the inflammation is very active, and has been neglected or improperly treated, the lymph is sometimes secreted so abundantly, as nearly to fill the anterior chamber ; in which case it has a light dirty yellowish tint, and often a looseness of texture, with semitransparency. 4thly, Under violent inflammatory action, blood itself is sometimes effused, and is mixed, in a coagulated state, with the tubercular masses of lymph. I have seen such effusion of blood where the inflammation has not been of the most violent kind. 5thly, Lymph may be poured out from the margin of the pupil or the uvea, so as to agglutinate them partially or generally to the capsule of the crystalline. A mass of lymph sometimes fills the pupil. More commonly, a thin greyish web or film stretches across the opening, which loses its clear black colour, and has a cloudy appearance. Lymph may be effused in considerable quantity into the posterior chamber, and either make its way through the pupil into the anterior chamber, cause a bulging of the sclerotica, or penetrate that membrane, and form a tumour under the conjunctiva. The former occurrence is exemplified in Case II., and the latter in Cases II. and III. I have lately seen another instance of the last description, in a tailor, who had eruptions and inflammation of the eye after a chancre. These symptoms got better, but the eye relapsed in consequence of the patient resuming his occupation prematurely. I found the iris nearly in contact with the cornea ; some red vessels were visible in it. The lower and inner half of the anterior chamber was filled with semi-opaque light yellowish lymph ; and a small portion of coagulated blood was seen near the ciliary edge of the iris. Lymph of similar appearance was partially visible behind the pupil, towards the nasal side. On the same side of the globe, the conjunctiva was raised into a tumour about the size of a pea ; and, from the appearance of its contents, through the membrane, there could be no doubt that they consisted of lymph. Such was the state of the eye at the end of about three months. When I saw the patient again, after an interval of five or six weeks, the globe had begun to shrink : the *conjunctiva oculi* was intensely red, the cornea opake, with a reddish tinge, so that lymph in the anterior chamber could be discerned through it with difficulty, and the protrusion of the conjunctiva continued of the same size, the brownish yellow lymph that it contained being more distinctly visible.

These albuminous effusions necessarily produce serious changes in the shape of the iris, and confine and impair its motions. The varieties of change in the appearance of the pupil are endless ; and the iris itself becomes almost useless as a regulator of the quantity of light admitted to the posterior chamber. Yet even this is by no means the worst that may result from iritic inflammation. The disease may spread by the ciliary circle and processes to the posterior chamber and its tunics, and, affecting the choroid coat or retina or both, may either thicken these membranes, and render them opaque, or destroy their tissue to such

an extent as to induce incurable amaurosis. Even its extension anteriorly to the cornea and sclerotic may be productive of signal injury. In this manner, syphilitic ophthalmia, though most generally originating in the iris, is almost always a disease of the internal tissues of the eye.

The diagnosis is perhaps of little moment, when it is remembered, that in treatment mercury is exhibited both in the idiopathic and the syphilitic form of iritis. But when it is deemed of consequence to determine whether any given case of iritis is idiopathic, or depends on syphilitic contamination, the history and concomitant circumstances afford the only certain criteria to determine the question.

On the question, whether the use of mercury is capable of producing iritis, as connected with the question on the syphilitic or mercurial origin of the disease, Mr Lawrence is inclined to think that the mineral is unjustly accused. The validity of every opinion of this kind, we must observe, is referable to the personal experience of different observers; and we do not imagine that the observation of any individual is competent to determine the point positively. On the whole, we believe that while it must be admitted that the syphilitic poison very often produces internal ophthalmic inflammation, it cannot be denied that occasionally mercury is adequate to the same effect. We have no hesitation, nevertheless, in confessing that we do not belong to that class of persons who imagine, that, because it may produce the disease, it cannot cure it, and ought not to be employed in the treatment. Although we cannot look on the mineral as altogether innocent, we acknowledge that we have used it with the most beneficial effects, after depletion, general and local, and the whole apparatus of the antiphlogistic method had been exhausted, without seeming to do more than convert the disease from acute into chronic; and we think no judicious practitioner would, in a case of rapidly advancing *iritis*, with threatened closure of the pupil, under the apprehension of bad effects which result in a small proportion of cases only, scruple to avail himself of the powerful sanative means which the mercurial influence affords.

On this point, indeed, we find Mr Lawrence expresses himself very much as we have now done; and we regard his estimate of the different modes of treating this disease and the several remedies employed, as perfectly just and consonant with sound observation. On this topic our limits permit us no longer to dwell; but we will not conclude without saying, that the present treatise deserves the attentive perusal of the practitioner, both medical and surgical. To those who read to verify the general descriptions in the text, the cases, which are minutely and accurately detailed, afford ample and satisfactory materials.

ART. VI.—*A Treatise on Poisons, in relation to Medical Jurisprudence, Physiology, and the Practice of Physic.*

By ROBERT CHRISTISON, M. D. Professor of Medical Jurisprudence and Police in the University of Edinburgh, &c.
(Concluded from Vol. xxxiii. pp. 443.)

WE have now arrived at the two last classes, into which Dr Christison has divided poisons. These are in some respects the most difficult, both as the symptoms they produce are more analogous to those arising from disease, and as they leave fewer evident proofs of their agency after death.

Under the head of narcotic poisons our author includes the consideration of opium, hyoscyamus, lactuca, solanum, and the hydrocyanic acid. Before entering, however, upon the consideration of these individual substances, Dr Christison treats of narcotic poisons generally. This necessarily introduces a good deal of abstract considerations, but of the highest practical utility, as the medical jurist, at the time of entering upon his investigations, has often no information concerning the species of poison exhibited. The diseases which may occasionally be confounded with narcotic poisoning are apoplexy, epilepsy, meningitis, inflammation of the cerebral substance, hypertrophy of the brain, diseases of the spinal cord, and syncopal asphyxia. Upon the diagnosis in each of these cases, the reader will find some very acute, and always accurate, observations.

Notwithstanding the numerous and extensive treatises which have been written upon the subject of opium, it has never been so satisfactorily examined as in the volume before us. This is partly owing to the progress made in our knowledge of the chemical constitution of this very powerful drug, and partly from the more strict scrutiny of what are called facts, which medical jurisprudence requires. Indeed, our only fear is that even yet the distorted observations made during the controversy between the followers of Cullen and Brown, in some degree influence our opinions. The account, for example, of the stimulating effects of small doses of laudanum, taken from Dr Leigh's experimental inquiry, is either altogether imaginary, or is to be ascribed to a very peculiar idiosyncrasy; for laughing, singing, or dancing, are certainly not the common effects of opium administered in any quantity, or in any way. When it does not produce stupor or distress, its usual effect is tranquillity, never inebriety.

Of the narcotic poisons, opium, which is the most frequently used, is also the most important. It is not only often employed

to commit suicide, and sometimes causes death accidentally, but it has been occasionally employed to commit murder. For this purpose, its common employment as a medicine, so that its possession is not conclusive evidence against a suspected person, and its taste being readily disguised by porter and other bitter beverages, render its administration unsuspected.

Dr Christison begins, as usual, with the chemical history and tests of opium. Prior to the discoveries of Sertürner, the smell and taste were the only characters of opium which were employed to indicate its presence. These indeed are sufficiently striking; yet they are evanescent, and disappear both in the stomach by the process of digestion and absorption, and by exposure to the air on the removal of the contents from the stomach, besides being liable to be rendered doubtful by the admixture of foreign, especially analogous smells and tastes. It is only within these few years that the progress of organic chemistry has enabled us to detect the presence of opium by means of chemical tests. Of the numerous constituents which opium contains, morphia, narcotine, and meconic acid, are the only ones which require any notice; and its poisonous effects are entirely derived from the first. Still a knowledge of the tests of the others is no less important, as they are peculiar to opium, and therefore when they are detected, they indicate the presence of the poisonous morphia, though the latter should have eluded our search. The chemical characters of these substances are now familiar to every one versed in the science; and for their application in juridical medicine, we must refer to Dr Christison. In particular, his limitation of the assertion of Professor Chaussier, that even a particle of morphia may be detected, is deserving of serious notice, as coming from an experienced toxicologist, lest too much reliance should be placed by those less skilful, upon the failure of the attempts to demonstrate its presence.

“By the process I have recommended, it is easy to procure from an infusion of ten grains of opium in four ounces of water, satisfactory proof of the presence of morphia by the action of ammonia, perchloride of iron and nitric acid, and equally distinct proof of the presence of meconic acid by the permuriate of iron, as well as by the sulphate of copper. But on proceeding to apply the process to organic mixtures, I found that, when the soluble part of ten grains of opium was mixed with four ounces of porter or milk, I could develop no other property of morphia except its bitterness, and could obtain but faint indications of meconic acid by the action of the permuriate of iron.”—Pp. 520, 521.

We cannot here enter into an examination of Dr Christison's account of the symptoms and effects of opium, which appear to us to include all that is known and is of importance to the me-

dical jurist. The treatment of poisoning by opium is judicious ; but it is omitted to state that it is of advantage to fill the stomach with fluid to promote the operation of emetics. This we saw well exemplified in a young woman with whom the emetics administered did not act, until the stomach was distended with tepid water, and vomiting was renewed every time it was distended. With regard to the antidotes proposed, Orfila objected to the use of vinegar, as rendering the morphia more soluble, and recommended a decoction of galls, which forms with it an insoluble precipitate. The solution of an alkaline carbonate has the same effect, and may be given to retard the action of opium, until we are able to remove it from the stomach.

Of the other narcotic poisons, henbane is the best known ; and although its effects generally resemble those of opium, they differ remarkably in the active delirium which precedes the sopor.

Hydrocyanic acid, which is the next poison treated of, presents many points of great interest. It exists as a natural secretion in many vegetables ; it appears during some decompositions of animal substances ; and it may be formed artificially entirely of inorganic elements. Dr Christison treats of it first in its pure state as prepared by art. Of its chemical properties we shall notice only those which present some novelty. The smell of hydrocyanic acid is peculiar, and is even considered as a sufficient test of its presence. But, according to Dr Christison, some persons seem to be scarcely sensible of it. The concurrent testimony of several individuals should therefore always be obtained. The smell is generally compared to that of bitter almonds, but, as Dr Christison justly remarks, it differs in being accompanied by a sense of acidity in the nostrils and back part of the throat. The most delicate test of its presence is the *protosulphate* of iron, as ascertained by Dr Turner and confirmed by Dr Christison, contrary to the statement of almost all the best chemists who recommend the *persulphate*. Hydrocyanic acid is easily separated from mixed fluids by distillation, after the addition of a little sulphuric acid to fix any ammonia that may be present.

For our knowledge of the effects of hydrocyanic acid on living animals we are chiefly indebted to the inquiries of Emmert, Coulon, and Krimer. It is a very speedy poison, capable of causing death in a very few minutes, or even seconds, generally preceded by tetanic spasms, sometimes without any symptoms whatever. This is observed in experiments on animals, and probably was the mode of death in a medical student, who was found on his bed dead, and as if asleep, with the phial beside him, from which he had swallowed the fatal draught. The body

of Judith Boswell was also found in a state of perfect composure. The action of hydrocyanic acid is exceedingly transient, so that if death is not caused by its immediate effects, or in the course of a few hours by the suspension of respiration, recovery takes place without any unpleasant effects succeeding. After death few traces of its action are found, none that is diagnostic. The most common is the fluid state of the blood; for although cases are quoted in which coagulated blood was found in the heart, yet fluidity is so common that this poison was used by Dr Kellie in his physiological experiments on the quantity of blood in the cranium as the means of preserving the blood fluid after death.

It was a very natural idea that we should find in alkalies antidotes of an acid poison; but that this expectation is erroneous is now proved by experiments, which show that it acts as a poison in all its combinations. Dr Christison, however, admits that the vapour of ammonia may in some cases prevent the fatal effect of the poison if the dose has not been great. The ammonia is here supposed to act merely as a stimulus, but the experiments of Dr Schaub,* published in 1792, were equally conclusive as to the virtues of carbonate of potass. He says expressly, "Propria, quæ institui experimenta, quorum pauca colligere liceat, alcali vegetabile venenatum indolem aquæ (laurocerasi) adimere me docuerunt."

The presence of hydrocyanic acid in vegetable substances was first ascertained by Schrader. The state of its existence in these is very curious. It is found chiefly in the *Drupaceæ* or trees which bear stone-fruit, and in many parts of these, in the flowers, leaves, bark, and especially in the kernel. Although it is separated from the other principles by distillation, it probably exists previously, since the smell, taste, and even the effects are observed in the raw material. It is singular that the kernel of one variety of the almond should be destitute of the poisonous principle, although it exists in other parts of the tree, and that of the other variety the kernel contains it in greatest abundance. Dr Christison has fallen into an error, a rare occurrence, in stating that the bitter almond is larger, and softer than the sweet. The reverse is decidedly the fact. Dr Christison has also quoted cases of fatal effects from what is called the expressed *juice* of bitter almonds. By expression, however, it is a fixed *oil* that is obtained, and this may be either innocent or deleterious, according to circumstances. If

* Diss. In. Chem. Med. sistens Laurocerasi qualitates medicas ac venenatas, imprimis veneni essentiam. Auct. Joan. Schaub, 8vo. Margburgi, 1792. See also the third volume of Baldinger's Collection of Marburg Dissertations.

no heat be used to facilitate its extraction, the expressed oil of the bitter almond is as bland as that of the sweet almond, but it becomes more and more contaminated with the bitter volatile oil in proportion to the degree of heat to which it is subjected. It is in the volatile oil and the water impregnated with it, obtained by distillation, that the poisonous principle is concentrated. The chemical constitution of these, which is exceedingly curious, has been examined by able chemists, as Vogel and Robiquet; but much still remains to be done. We shall only remark, that the distilled water continues active for many years without particular attention to its preservation, while even weak hydrocyanic acid speedily becomes effete, notwithstanding the utmost care. On this account the distilled water of the bitter almond and of cherry-laurel seems to us preferable as medicinal agents. We cannot, however, in recommending them, omit giving the caution that, after being distilled and allowed to stand some time, these waters *must* be filtered through dense bibulous paper, that not a particle of oil may be left floating on the water.

After the detection of hydrocyanic acid in the oil of bitter almonds, it was supposed that the oil, whose mode of action entirely corresponds with that of the chemical acid, owed its poisonous quality to the latter alone. But, in the first place, the oil is hardly inferior in activity to the pure acid, which constitutes only a very small proportion of it; and, moreover, although the acid be entirely removed by rectification with caustic potass, the oil retains the odour of the original oil, and possesses powerful poisonous qualities. The oil also separates spontaneously into two kinds of oil, one concrete and crystallized, a *stearopte* of Berzelius, and the other fluid and uncrystallizable, an *elaeopte*. The former is innocent, the latter poisonous, and it contains azote. Is it, although not an acid, a modification of cyanogen? For these curious facts we are indebted to Vogel and Robiquet.

As a subject of legal medicine, oil of bitter almonds coincides nearly with hydrocyanic acid; but it is more likely to produce accidents, as it is prepared in considerable quantities, and sold to rectifiers and confectioners, to make *liqueurs*, and give the *ratafia* flavour to biscuits. We were told by an eminent apothecary, that he himself had sold no less than twelve ounces in one phial.

Of the other vegetables containing prussic acid, the leaves of the cherry-laurel have acquired the greatest celebrity from its having been used to poison Sir Thomas Boughton.

Dr Christison treats of the poisonous gases after the narcotic poisons. He is aware that this arrangement is not strictly sys-

tematic, as only some of them are narcotic, and others are irritant; but there are advantages in considering them together. The irritant gases are nitric oxide gas, nitrous acid vapours, muriatic acid gas, chlorine, ammonia, sulphurous acid, &c. The narcotic gases are sulphuretted-hydrogen, carburetted-hydrogen, carbonic acid, carbonic oxide, nitrous oxide, and cyanogen. The subject of the narcotic gases is exceedingly interesting, but we cannot enter upon it for want of room. We may, however state, that there is nowhere to be found so full and correct an account of their action as in the volume before us; and we may point out the ingenious and original experiments of our author, in conjunction with Dr Turner, on their action upon vegetables, as illustrating their action upon animals.

The poisons referred to the last class are distinguished by possessing a double action, one local and irritating, the other remote and narcotic. Dr Christison, following Orfila, divides them into six groups, upon principles which, however, are not very systematic. The first has for its distinctive character delirium as the principal symptom. It includes plants belonging to the natural families of *Solanaceæ*, *Umbelliferae*, *Ranunculaceæ*, *Liliaceæ*, *Personate* and *Colchicaceæ*; and it is worthy of remark, as supporting De Candolle's doctrine, that plants agreeing in botanical characters also agree in virtues, that the action of the individuals in each of these families is analogous in the same family, and somewhat distinct from that in the others.

The second group have the very singular property of producing tetanus without impairing the sensibility or mental functions. The individuals all belong to the *Strychnæ*; and the deleterious principle is now well ascertained to be the alkaloid called *Strychnia*, whose action is so well understood that it is employed with success for the cure of diseases of the voluntary muscles.

The third group includes substances which produce tetanic spasms, and also impaired sensibility. To this class are referred camphor, the *Cocculus Indicus*, and the *Upas antiar*, from the *Antiaris toxicaria*. This group is, therefore, not natural, either botanically or chemically, as the plants belong to the different families of *Laurineæ*, *Menispermæ*, and *Urticeæ*, and the active principles are camphor and picrotoxin, and that of the *antiar* is unknown.

The fourth group is merely botanically allied, and probably includes individuals of different action and different chemical nature. It comprehends all the poisonous fungi, which must be studied individually.

The fifth group includes poisonous grain. It is remarkable that in the very numerous family of the *Gramineæ*, one species,

and one only, should have poisonous seeds, the *Lolium temulentum*; but some of the most wholesome and nutritious become injurious from diseases, as rye affected with the ergot, and wheat with the rust.

The last group of the narcotico-acrid poisons is formed of a small number of substances which are the products of art, and comprehends only alcohol and ether.

We have been obliged to content ourselves with giving a mere index of the latter part of this volume, because almost every section is equally interesting, and it would have extended our analysis to an unreasonable length to have attempted to condense the information to be found on such a variety of subjects.

In fine, no person now doubts that the study of Toxicology is indispensable to practitioners of every description; and, as enabling them to study it with advantage, the profession is under the greatest obligations to Dr Christison.

ART. VII.—*Introductory Lectures to a Course of Military Surgery, delivered in the University of Edinburgh.* By GEORGE BALLINGALL, M. D. F. R. S. E., Regius Professor of Military Surgery, Fellow of the Royal College of Surgeons; Surgeon Extraordinary to the King in Scotland, &c. &c. Edinburgh, 1830. 8vo. Pp. 246.

IT may be doubted perhaps whether the denomination of *Military Surgery* is very well chosen, since it is used to denote not merely the knowledge requisite to treat those wounds and injuries which are incident to the mutual conflicts of hostile forces, but that of the prevention and treatment of diseases incident to numerous bodies of men in fleets and in armies, intimate acquaintance with the circumstances which tend to maintain troops, whether in quarters or in the field, in a healthy and effective state, and experience of all those means and resources by which the necessary effects of the accidents of flood and field may be counteracted and alleviated. The accomplished military surgeon, in short, must be acquainted, not only with surgery properly so named, but with the etiology of diseases, epidemic and endemial, the most approved means of prevention and of treatment when prevention is impracticable, with the geographical distribution of diseases, and the comparative characters of healthy and insalubrious stations.

We do not regard it as necessary to consider the question of the utility of this species of knowledge to any particular class of the profession. We take it for granted that every particu-

lar application of the great general principles of the healing art is neither absolutely good nor absolutely bad, but is proper or improper, necessary or superfluous, only according to the circumstances of different classes of the profession, or the peculiar situation of individual practitioners. Several departments of medical knowledge and professional study, which may be superfluous to the civil practitioner, become indispensable to him who is attached to the public service ; and the military and naval surgeon, though indifferent to many points requisite to the civil practitioner, must be intimately conversant with others which, to the latter, are uninteresting and useless. Call it by what name you will,—military surgery, military medicine, or the medico-chirurgical management of fleets and armies, which, in point of fact, it is, no one can deny that such an application of medical knowledge is of the utmost importance in any state of society, and in any community in which military or naval operations are of any moment whatever. Though it is neither to be desired nor hoped that the country shall be again involved in naval and military operations of the same extent and multiplicity as those which distinguished the last period of continental warfare, it is always desirable to possess the means of rendering our forces efficient, and preserving them in a state fit to endure, with the least possible injury, the severe duties of the field, and the not less harassing services of the blockading squadron.

It is chiefly with the view of communicating some idea of the qualifications requisite for the practitioner of the public service, that Dr Ballingall has published the present discourses. In the first, after some remarks on the general objects of military surgery, the author gives a short historical view of the different writers who have distinguished themselves in this department of medicine,—from Paré, Gale, Clowes, Lowe, Woodall, and Wiseman, down to the more recent authorities who have appeared in our own day, Guthrie, Hennen, Larrey, and Thomson. In the second, are treated the physical qualities requisite for soldiers and the inspection of recruits, the best mode of preserving the health of troops, the equipping and clothing of troops, the regulation of their meals, the prevention of the use of intoxicating liquors, personal cleanliness, and periodical exercise. The third lecture embraces the subject of accommodation of troops in camp and quarters, the circumstances which determine the healthiness or insalubrity of particular situations, and the rules to be observed in the choice of ground for encampment or bivouac. The fourth lecture is devoted to the subject of military hospitals, the best mode of constructing and ventilating these receptacles of sickness, the construction of barracks, the food of the sick, the advantages of regimental over

general hospitals, and the several modes of conveying the sick and wounded from one place to another.

We do not propose to enter into detail in examining the manner in which these subjects are treated by Dr Ballingall. It is manifest that where a subject consists chiefly of judicious applications of facts already established and principles well known to particular circumstances, much must be done in the way of compilation; and all that the author can aspire to, is to develop in a distinct and perspicuous manner the general principles which he thinks it important to impress. While this necessarily renders the discourses of Dr Ballingall less novel in subject than if he had attempted a more original course, he is justly entitled to the thanks of those attached to the public service for collecting from a great variety of sources, and presenting in a short compass, the topics of greatest importance and interest. Dr Ballingall obviously disclaims the idea of instructing those who are already familiar with the writings of Pringle, Donald Monro, Dr John Hunter, Brocklesby, Jackson, Hennen, Guthrie, Hutchison, and Marshall; nor would it be fair to estimate the merits of his work on such a criterion. There is one circumstance, however, which strongly recommends the work of the present author to the attention of the medico-military reader. It is the production of one who, like the writers now mentioned, has spent the early part of his professional life in the military service of his country; who has more than once encountered and had occasion to remedy several of the evils which he considers; and who has evidently not been indolent in availing himself of the means of improvement which it affords. Coming from one who has been repeatedly placed in situations requiring him to practise the rules which he prescribes, it must form a valuable guide to the beginner who is preparing himself for the duties of regimental surgeon or hospital-assistant; and if it were of no other use than indicating the best sources of information, it would still be a useful treatise.

The fourth and last lecture, we must add, relates to subjects, in several of which many improvements have been of late years effected, and others are altogether new. Of the former description are the observations on the economy and management of hospitals, their internal arrangements, and the means of obviating the approaches of disease. Of the latter nature are the remarks on the different modes of conveying the sick and wounded from one station to another, or from the field of battle to a distant hospital. On this, which is a subject of great practical importance, the present author has bestowed particular attention; and he has laboured to render it intelligible by models of the most useful and convenient machines which have been proposed or adapted to this purpose.

[Addition to Original Communications.]

ART. VIII.—Remarks on the Treatment of Amaurosis by Strychnine, with several successful Cases. By THOMAS SHORTT, M. D., F. R. S. E. Fellow of the Royal College of Physicians, Edinburgh, one of the Ordinary Physicians to the Royal Infirmary and Fever Hospital, &c.

HAVING been induced, by the perusal of several successful cases of paralysis, published in the Glasgow Medical and Surgical Journal of May 1829, to try the effects of strychnine introduced into the system through blistered surfaces, it occurred to me, on examining a patient sent by Mr Liston from the surgical wards of the hospital, and who laboured under amaurosis, apparently owing to paralysis of the retina, that this substance might be beneficially employed in relieving blindness from that cause. As in this case almost every other remedy had failed, I lost no time in putting the patient under its influence. The effects, as detailed in the case of Hamilton, No. 1 of this series, were so satisfactory that I felt warranted in giving the remedy further trial. The result of this will be seen by the cases which follow his. It was not my intention to have laid them before the public until I not only had decided in my own mind as to the efficacy of this medicine, but also was enabled, from farther experience, both to give some specific directions in regard to its employment, and, what is of much more importance, to point out the symptoms of those cases of the disease in which its use promises success. Some of the cases, however, which had been thus treated by me, having been published without my consent, I have been urged by several professional friends to submit, without further delay, even an imperfect sketch to the profession. I own I do so reluctantly, as I am satisfied that much is yet to be learned regarding the use of strychnine; but not without hope that it may prove of service in exciting to a more extensive trial of the remedy than my situation, unconnected at present with any of the public eye institutions, can permit me to make. Having formerly had charge of the Ophthalmic Hospital in Egypt, serving with the army under Lieutenant-General Mackenzie Fraser in 1807, afterwards having been entrusted with the same duty in Sicily, and lastly with the entire charge of an experimental hospital on a large scale at Rhametta in that island, expressly formed for the treatment of chronic ophthalmia and its consequences, gave me ample opportunities of witnessing such diseases under almost every form, and at the same time of often regretting their

unsuccessful issue, especially in amaurosis. Such experience is calculated to secure me against the error of attributing to one means only the power of relieving this disease or any other affection; while, in the absence of anything more satisfactory respecting the management of a very untractable affection, it may entitle me to some confidence in offering the present practical remarks. Moreover, as perhaps the first person who employed strychnine in amaurosis, and as having used it more extensively than most other individuals, I imagine my observations can hardly be deemed either intrusive or unimportant, however imperfect or inconclusive future inquirers may prove them to be.

I consider strychnine to act purely as a stimulant either of the nervous matter of the nerves, or of their capillary system; and, therefore, to be successfully employed only in amaurotic cases, which depend on paralysis of the optic nerve and retina, or in cases of congestive amaurosis from pressure on these parts, with a loaded and inactive state of the minute vessels of the neurilemmatic envelope.

These affections are often ascertained with difficulty, and, therefore, cases may be viewed as such, though arising from structural derangements of the interior of the organ of vision. In these, as in others arising from severe or long-continued internal inflammation and other causes, strychnine, I apprehend, can be of no possible service. The same thing may be said of amaurosis depending on clots of blood, or tumours which press upon the optic nerves. Where again, as is frequently the case, the disease is owing to the absorption of the medullary portion of the nerve, it must be allowed that nothing can be expected from it or any other medicine. In fine, in my opinion, it is only in cases of paralysis of the optic nerve, and those arising from congestion, that strychnine can be advantageously employed; and I think the following examples, and those already published by Mr Liston, Mr Guthrie, and others, must decidedly prove its efficacy in them. It is not immaterial to observe, that in such cases its beneficial operation is considerably aided by the previous use of mercury, possibly either by exciting the nervous system, by rousing the energy of the capillaries, or by increasing the powers of absorption, or by all three conjointly. Thus, in No. 5, strychnine failed until mercury had been employed; but on its application, and then only, vision was improved; and in cases Nos. 7 and 9, its decided effects followed the use of that medicine.

I cannot positively say whether the effects of strychnine are lasting, but I believe it in most cases to be so if properly used. I may safely assert also, that in no case in which I have

tried it has vision been injured, where the disease existed in one eye only, or where sight was not entirely destroyed. In no case did any constitutional evils arise from its use. I am inclined also to believe, from one or two instances, that it was beneficial in removing opacities of the cornea, probably by its highly stimulating property occasioning rapid absorption.

In delicate persons, or where the system is affected by mercury, I ought to add, the strychnine should be commenced in small doses, *e. g.* not exceeding a quarter of a grain, and increased daily until it produces sensible effects on the constitution, such as headach, pricking pains over the body or tremors, when it should be discontinued, and, on resuming it, the dose should always be considerably reduced.

Where unpleasant symptoms arise, I can suppose that camphor in large doses, or an opiate enema, suited in strength to the violence of the symptoms and the constitution of the patient, or, as recommended by M. Lembert, the application of morphine in small doses, sprinkled on the blistered surfaces, will be found to give relief; but in no instance have I judged it necessary to employ any of them.

Several of the cases here detailed were attacked with erysipelas, which strychnine seems prone to occasion; but they were invariably relieved by simply rubbing about a drachm of mild ointment or cold cream over the diseased surface every four hours.

Mr Fife, surgeon of the Eye Infirmary at Newcastle, has employed strychnine internally in several amaurotic cases, accounts of which he has had the kindness to send to me. Two are now published with his permission. All the cases relieved by me, I ought to remark, had some remains of sight before this remedy was employed; and it may not be uninteresting to add, that in a case of glaucoma, attended with deafness, where strychnine was used, the latter affection was relieved, but without any improvement in vision, as was also the result in one of Mr Fife's cases.

CASE I.—Peter Hamilton, *æt.* 22, an iron-founder, admitted 16th June 1829, can only distinguish light from darkness. Both pupils are much dilated, the right more than the left. The iris in both is sensible to the stimulus of light. The eyes are clear, and, with the exception of a slight squint, present a natural appearance. This state of vision has continued two years. His account of its commencement is as follows.

Having been for some years daily working under exposure to the heat and light of an iron-founder's furnace, he became affected with indistinctness of vision, accompanied with flashes

of light when looking at minute objects, or when stooping. This indistinctness became gradually more and more obscure for fifteen months. At the end of this time he could only distinguish light from darkness, and has remained in that state nine months. His general health had all along been quite good.

17th, The temples were shaved and blistered, and one-eighth of a grain of strychnine dusted the following day on each side.

23d June, (6th day.) Within the last week a blister has been twice in succession applied to each temple, and to the raw surfaces, first one-eighth, then one-fourth, and to-day half a grain of the powder of strychnia. The pupils are less dilated, and the iris readily contractile; strabismus almost gone; tongue rather foul; bowels open.

25th, Can to-day distinguish colours pretty readily, especially with the left eye, the iris of which is less sensible than that of the right. Half a grain was applied to each temple.

26th, Still continues to improve, and can distinguish yellow and red colours; some headach, and tongue much loaded and white. Three-fourths of a grain to each surface; a cathartic mixture.

27th, Less headach; sight considerably improved, for he can distinguish print from writing. One grain applied to each surface

28th, Vision more distinct. Had an additional grain and a quarter yesterday. Had $1\frac{1}{2}$ on each surface.

July 2d, (15th day.) Had $1\frac{1}{2}$ grains on the 30th. On the 1st an attack of rigors, debility, sickness, vertigo, and headach, which are now gone, but feels weak. Can now clearly distinguish objects placed at the distance of some paces, and reads easily the hour upon a watch by evening twilight; iris of both eyes quite sensible. Intermit strychnine.

4th, Sight still further improved. Renew the blisters, and one-fourth grain of the powder.

13th, Can now distinguish objects clearly at considerable distances. Pupils continue more contracted, although less than naturally. Strychnia from one-fourth to three-fourths of a grain has been applied as before.

26th, Strychnia has not been applied since last report, from a sensation of violent heat over the skin.

August 4th, Since the last report two grains have been applied to each temple without any obvious effect; but improvement in vision continues.

16th, Has had two grains on each temple for eight days. Repeat blisters, and apply $2\frac{1}{2}$ grains to each surface.

September 8th, (79th day.) Since the last report he has

been applying the strychnia every day, from 2 to $3\frac{1}{2}$ grains on each temple without any constitutional effect, but with continued improvement in his sight.

There were some days of intermission, when the blisters were obliged to be renewed. Yesterday he left the Infirmary, and attempted to work; but finding that the act of stooping occasioned dimness of sight, he returned the next day and resumed the strychnine, to the extent of three grains on each temple, and continued gr. ijss. to the 13th. It was then omitted, and on the 31st, when he could see perfectly, he was ordered to apply the vapour of ammonia for a few days. The eyes appeared quite natural, the squinting gone; and he was enabled to tell the time upon the Tron Church clock from the Infirmary windows at the distance of 300 yards.

CASE II.—Andrew Drummond, æt. 34, a ship-carpenter, admitted October 2, 1829. This patient can only distinguish light from darkness, a window from the wall. The pupils of both eyes are rather contracted, and there is but little sensibility of the iris. In the left eye there is a ring of opaque substance, the remains of a cataract, the centre of which was removed by an operation; but although the light was thereby admitted, he was still unable to see. This ring can only be observed when the pupil is dilated. This state of vision, which, with little change, has continued six years, commenced as follows.

He had been employed as a flax-dresser six months before he was attacked with fever at Dundee. This was about six years ago. But some weeks previous to this attack, dimness of sight had gradually come on; and then, during the delirium of fever, his sight was totally lost, and likewise his hearing. During his convalescence he regained his hearing, but remained nearly quite blind, sometimes, however, distinguishing light from darkness. A year after this he was admitted into the Infirmary, had the centre of the cataract removed from the left eye, was blistered, and had setons both in the nucha, and in the inside of the arms. But he left the hospital without receiving any benefit to his sight. Two years ago he returned to the house, underwent medical treatment, took mercury, renewed his blisters and setons, and left the house again without any distinct improvement, but only thinks he saw a little more clearly. He has since his fever enjoyed good general health.

Oct. 3d, A blister having been applied to the right temple, yesterday one-fourth of a grain of strychnia was dusted upon the raw surface; and states that he saw a little with the right eye about six hours after the application, and that almost im-

mediately after he felt a shooting pain across his forehead, but no other sensation. One grain to be applied.

5th, Says he did not feel the application of the whole grain so much as the first quarter, but thinks his sight still improved. Full diet. Blisters renewed.

7th, (5th day.) One grain since last report. Can now distinguish large from small letters; some vertigo last night. $1\frac{1}{2}$ grain and *aqua ammoniac*.

10th, Since last report a fresh blister and three grains have been applied as before. Sees the Tron Church steeple from the window, and distinguishes the colours of the ward, which he could not do yesterday. One grain as before, and a cathartic mixture.

13th, Since the 8th, $2\frac{1}{2}$ grains have been applied. Noticed yesterday with his left eye the bars of the window. Two blisters since applied have risen well. Strychnia omitted yesterday, and no further improvement in sight. Apply $1\frac{1}{2}$ grains.

18th, Five grains since the 13th, and a renewal of the blisters. Complains of the light affecting his eyes, which he had not experienced before.

22d, Three grains since the 18th, with alternate blisters on each temple. Can to-day see men walking at a distance, which he could not do yesterday.

Nov. 7th, Since the 22d, $19\frac{1}{2}$ grains have been applied, at most $2\frac{1}{2}$ grains at once. His sight gradually improving, and the intolerance of light removed entirely. Strychnia has been intermitted, and his appetite improved by the tincture of calumba. He can now see (Nov. 11th,) to read the hour upon a common watch—but he cannot yet distinguish small print.

He continued in Hospital till about the end of November, during which time his sight was still further improved.

CASE III.—George Miller, æt. 52, a mason, was admitted on the 4th July 1829, labouring under amaurosis.

The vision of both eyes was very considerably impaired, but especially that of the left, with which he can but faintly distinguish the colour and shape of conspicuous objects when placed near him. Its pupil was slightly oblong, in a transverse direction, and always remained more dilated than that of the right eye, with the motions of which pupil it seemed chiefly to sympathize, contracting pretty readily upon the simultaneous admission of a strong light into both, whilst, when equally exposed alone, it contracted very tardily and imperfectly. Behind it the faintest degree of haze was perceptible. The right eye presents a perfectly natural appearance. Both eyes became affected with indistinctness of vision between four and five

months ago, and some weeks after their having been cured of a pretty severe attack of inflammation, which had commenced towards the end of last year, in consequence, he thinks, of some lime floating in the air having entered them. He has used mercury internally, and applied repeated blisters without any benefit to the present affection. The general health is good. Both temples were blistered in the evening, and $\frac{1}{8}$ of a grain of strychnine sprinkled over each surface the following morning, and repeated for several days without apparent effect. The first blisters having healed, and a second pair being applied to each temple, one grain of strychnine was sprinkled on each the following day. This was followed by giddiness and tremors, which continued for two days, during which the strychnine was intermitted, and the second blisters healed. No apparent change. The blisters were therefore renewed, and only a quarter of a grain of strychnine applied to each surface. The following day, (14th July,) being the ninth day since the strychnine was used, the sight of the left eye was found to be so far improved, that the patient could distinguish the Hospital bedding which was exposed to the air on the ground behind the Infirmary. In a few days the pupil of the same eye became more active, and the improvement in sight advanced. The strychnine and blisters were continued as usual, but no further change took place till the 4th of August, when he said he could discern objects at a considerable distance with the left eye, the pupil of which continues dilated to the same degree as formerly. The same treatment was pursued till the 23d of August, when he considered his vision still further amended; on the 4th of September, again stated that improvement has taken place; also on the 6th, when he was able to distinguish objects at the distance of a quarter of a mile. Discharged. This patient used about eighty grains of strychnine. The greatest quantity applied at any one time amounted to $5\frac{1}{4}$ grains.

CASE IV.—William Smith, a labourer, æt. 31, was admitted into the Royal Infirmary on the 13th October. Could only distinguish light from darkness; pupils not dilated, and the iris, which is grey, was slightly sensible of light in both eyes. Over the left cornea there was extensive opacity, and sees more light in consequence with the right eye. General health good. Stated that twelve years ago, while going to his work, he perceived one morning a dimness of sight, as if there was smoke before him. In the course of three days from this he became totally blind, and, notwithstanding active blistering, continued so. About a year after he regained his sight partially, so as to enable him to reap during part of the harvest, but he was always obliged to be led home at night; since which time, he has been

in the state above described, and has used no remedies whatever. He was blistered, and the strychnine was used the following day, which produced, as in many of the other cases, a very bitter taste in the mouth after application. He had some pain in the balls of the eyes also, but no improvement in sight. On the following day, however, slight amendment took place in the left eye, but he suffered during the night from headach. The treatment was continued, and on the 22d of October the headach was again severe, with pricking pains in the arms and legs; but the sight had so far improved, that he was able, for the first time, to distinguish the bars of the windows. The sensations continued, and on the 26th the vision of the right eye was improved. On the following day improvement took place; the forehead swelled; and the pricking pains extended to the finger-ends, when the strychnine was omitted. On the 30th of October the opacity of the left cornea was considerably diminished both in extent and deepness. On the 1st of November he was able to distinguish a book, and said his sight was stronger. Had leave on the 4th of November to go out for a few hours; was able to distinguish men from women, and in walking along was able to avoid coming in contact with people on the street, which he could now traverse without inconvenience. On the 10th of November began to see downwards, and could distinguish any thing on the table; was slightly improved beyond this, when he was discharged by desire.

CASE V.—James Rankine, admitted July 7th, 1830. Two years ago he was suddenly seized with deep-seated pain over the right eyebrow, accompanied with dimness of vision in the right eye, from a constant appearance of small floating objects before his sight. The pain in a short time disappeared, but the amaurotic symptoms continued increasing till fifteen months ago, since which time he has been unable to distinguish light from darkness, unless with a very small portion of the inner side of retina. The iris of the right eye is of a dark hazel colour, that of the left gray. Pupil moderately dilated and regular; slightly sensible to light. Posterior part of the eye has a greenish hue; has no pain in the eye.

Three months ago symptoms of incipient amaurosis commenced in the left eye, (not, however, preceded by headach, or pain in the eyeball.) These have since gradually increased, so that he is now unable to read print of a large size at a moderate distance. There is a constant appearance of *muscae volitantes* before his eyes, and these have occasionally a dazzling brightness, and at other times assume the appearance of a reticulated web. Pupil moderately dilated, regular, and sensible to light; the posterior part of the eye seems natural. Health

good; other functions natural. Blisters, purging, and mercury have been used without relief.

On admission, the application of Extract of Belladonna to eyebrows caused great dilatation of pupils, but considerable impairment of vision.

Blisters were applied to the temples, and *Pulv. Strychniæ*, gr. v. at three different times to their surfaces, without producing any sensible effect.

Pilulæ Submur. Hydrarg. c. Opio were then administered till ptyalism was produced; and while the system was under the action of mercury, blisters were applied to the temples; but no change in vision took place, till on the application of one grain of strychnia to their surfaces, violent vertigo, headach, and other symptoms of its action were induced. Vision at the same time was greatly improved, so as to enable him to read common sized print. The appearance of *scotomata* in a great measure removed, and the iris of the right eye rendered more sensible to light.

The *Pulv. Strychniæ* was subsequently applied with the same effect in a slighter degree, and vision continued improving in the left eye, when, being a farm-servant, he was obliged to return to his work, and was dismissed by desire on the 24th July.

CASE VI.—John Watson, æt. 40, paraplegia with partial amaurosis of left eye. The loss of power over the bladder, rectum, and lower extremities, accompanied by absence of sensation, has been gradually increasing for twenty days. Amaurosis is of two years duration, stationary, a small portion of the retina retaining its sensibility. The eye free from any morbid appearance; pain in the head. Pulse 100, full; tongue furred; bowels torpid.

January 18th, 1830.—*VS. ad 3æxv. Appl. Emplas. Lyttæ Nuchæ. Hydrarg. Submur. gr. v. q. nocte sumend. Infusi Purg. 3ij. 2da qq. mane.*

28th, Pain in the head removed; bowels acted upon more easily; pulse more free and softer; tongue in some degree improved; amaurosis rather increased; legs motionless and insensible; but more control over the bladder and rectum.

Feb. 2d, Symptoms by no means ameliorated since last report, although the same treatment has been continued, or rather occasionally had recourse to, as indicated.—*Applic. Potass. Fusa ad nucham.*

18th, Symptoms unchanged; complains occasionally of a sense of constriction about the præcordia.—*Capt. Strychniæ gr. ½ 3tia qq. hora.*

16th, *Capt. gr. ¼ Strych. 3tia qq. hora.*

19th, Violent shooting pains in the course of the sciatic

nerves; shooting pains in the forehead; convulsive action of the muscles of the legs and thighs; pain in the epigastrium; constipated bowels; pulse 100, contracted; great depression of spirits; tongue coated.—*Omitt. Strychnia. VS. 3xx. Sumat. Infus. Purg.*

21st, Bowels open. Pulse 80, free. Tongue clean.—*Capt. Strychn. gr. ¼ 6ta qq. hora.*

R. Magnes Sulph. ʒiij.; Magnes Carbon. ʒi.; Misturæ Camphoræ ʒiss. M. ft. haust. omni mane, sumend.

March 2d, Since last report occasional pains in the epigastrium mitigated by the opiate draught, and omitting the strychnine for a few hours. Less convulsive motion and less pain, but more sensation and voluntary motion, and evident improvement in the vision of the left eye, which yet looks healthy. Pupil as before like that of the other eye.—*Cont. Strychnia.*

15th, Progressive improvement.—*Cont. Med.*

April 2d, Improvement such as to excite sanguine hopes.—*Cont. Med.*

June 1st Vision useful. Cannot yet walk without assistance.—*Cont. Med.*

July 19th, Continues improving.

CASE VII. Walter Henderson, æt. 43, admitted June 3d, 1830. Has had for twenty-two years almost perfect amaurosis of his right eye, a small portion only of the retina remaining sensible to light. It commenced after an attack of iritis, which was removed by the usual antiphlogistic remedies; but the symptoms of amaurosis continued increasing, and in a short time attained its present state. The iris is of a dark-brown colour, and insensible to light. Pupil moderately dilated, and irregular; posterior part of the retina has a greenish hue; has no pain in the eye.

The left eye remained unaffected till two months ago, when the usual symptoms of amaurosis commenced in it, accompanied with those of iritis. The latter were removed by antiphlogistic treatment, but the amaurosis has continued still to increase. All objects appear to him covered with a dense mist, which at times has a dark-brown, at other times a light gray, colour. It at first appeared in the form of *scotomata*, which have gradually increased so as to assume the above-mentioned appearance. Occasionally in the dark flashes of light appear before his eyes. Is unable to read the largest print, and when walking the street constantly runs against obstacles which come in his way. Pupil is contracted, very irregular, and sluggish in contracting on exposure to light. The posterior part of eye has a very slight greenish tinge; has no pain in the eye or headach; health good; other functions natural.

After admission the Extract of Belladonna was applied to the

eyelids. By it the pupils were dilated; appeared very irregular, and vision at the same time much impaired. *Pil. Submur. Hydr. c. Opio*, were administered till slight ptialism was induced, and a blister applied to each temple; but no change in the vision took place. One grain of *Pulv. Strychniæ* was sprinkled on the blistered surface without producing any sensible effect. Next day, however, on the application of two grains, slight headach, vertigo, and the usual symptoms produced by strychnia in a small degree, were induced. Vision in the left eye was at the same time considerably improved, so as to enable him to read print of a moderate size, and the cloudiness rendered much less dense. His system was again slightly affected with mercury. Blisters applied to his temples, and *Pulv. Strychniæ*, ij. grains, to their surfaces, which in a short time produced vertigo, headach, slight tremors, and other constitutional effects. Vision was also greatly improved. Has, during the treatment, had slight attacks of iritis, which were always removed by the application of belladonna to eyelids.

Reported as follows:—August 9th. Is able to read the smallest print. *Visus Nebulosus* almost completely removed. Pupil of left eye still small and irregular; that of right moderately dilated, regular, and sensible to light. No change in the vision.

August 11th, Dismissed much relieved.

CASE VIII.—Isabella Wailes, æt. 30, admitted November 21st, 1829. Perfect amaurosis of four months' duration, following a sudden suppression of menstrual discharge, by the application of cold to the feet. Has headach, deafness, occasional stupor; amenorrhœa continues; bowels torpid; tongue foul; pulse 90; apoplectic. Has been ten weeks under treatment at the General Infirmary.

In this case depletion, local and general, purging, blistering, and mercury were employed; and by February 16th pain in the head was relieved; pulse free; less stupor; bowels more active; tongue cleaner; deafness continues; and the pupils are enormously dilated. The eyes otherwise look healthy, but remain perfectly insensible to every degree of light.—*Capt. gr. ½ 5ta qq. hora.*

27th, Less deafness; pupils smaller.—*Cont. Pilulæ.*

March 6th, Deafness nearly gone; pupils smaller; general appearance more healthy. Complains of uneasiness about the epigastrium, and shooting pains in the head.—*Cont. Pil. Strychniæ.*

13th, Pupils reduced almost to a natural size, and have become moveable. Shooting pains continue through the head, accompanied by flashing of light; has menstruated.—*Cont. Strychnia.*

16th, Countenance much improved. Endures pain from exposure to strong light, although there is yet no power in distinguishing objects. Pulse fuller.—*Cont. Strychnia.*

Soon after this report the first class of symptoms returned, in consequence of which strychnine was abandoned, and depletion adopted. Stupor was the precursor of the other head-symptoms; and it was followed by deafness, total insensibility to light, and dilated pupils. The symptoms of pressure on the brain have been again relieved; and within the last ten days strychnine has been resumed, and menstruation continues regular.

CASE IX.—Janet Barclay, æt. 28, admitted June 18th, 1830. Two years ago symptoms of incipient amaurosis commenced in her right eye. These continued gradually increasing till a few months ago, since which time the amaurosis has been almost perfect, a small portion only of the retina retaining its sensibility, so that at the distance of six inches from the eye, the sphere of vision does not exceed a circle of half an inch in diameter, and in that small space sight is very imperfect, from a constant appearance of *muscæ volitantes*.

The left eye became similarly affected, but in a much less degree, three months ago. In it the *visus reticulatus* is now very perfect, rendering her unable to see objects distinctly at a very short distance, or to read the largest print.

The pupils are moderately dilated, and slightly sensible to light. The posterior part of both eyes seem somewhat opaque. The amaurosis, at its commencement in the right eye, was accompanied with deep-seated pain in the eyeball, which, after a short time, disappeared; but recurred when the left eye became affected, and has continued more or less since. Bowels irregular; other functions natural. Blisters have been applied to her temples and nape of neck, without effecting any improvement in the vision.

The application of Extract of Belladonna to the eyebrows produced its usual effects. The system was affected slightly by mercury, and purgatives administered, without any beneficial effect. Blisters were then applied to her temples, and one grain of strychnine sprinkled on their surfaces. This application was continued till it occasioned considerable vertigo, headach, tremors, &c. Vision rapidly improved under the above treatment, which was at different times repeated with the same success, so that on July 26th, the sphere of vision in the right eye was restored to almost its natural size, and the appearance of *muscæ volitantes* removed. The *visus reticulatus* in the left eye had likewise almost completely disappeared. Had no pain in the eyeballs or headach, and she was dismissed cured.

PART III.

MEDICAL INTELLIGENCE.

PHYSIOLOGY AND PATHOLOGY.

On the Cause of the Entrance of Air into the Veins during Operations on the Neck. (*Archives Générales de Médecine*, Juin 1830.)—It is well known that on several occasions death has taken place suddenly during surgical operations on the neck, and that the accident has been traced to the admission of air into the heart and great vessels by the mouths of divided veins. But no satisfactory explanation has yet been given of the fact that such an accident occurs rarely, or of the circumstance that air should ever obtain entrance at all. For although most physiologists now admit to a certain extent the principles laid down by Dr Barry, as to the venous circulation and the suction-power which is excited during inspiration on the blood in the veins that enter the chest,—still, as *M. Berard*, the author of the paper quoted above, has remarked, it is not easy to see how this suction-power should have the effect of drawing air into the cavity of a flaccid vein, the parietes of which must yield to atmospheric pressure before any fluid, even aeriform, can enter by an opening in it. *M. Berard*, however, has succeeded in explaining the cause of the entrance of the air; and has likewise discovered in this cause an organization of considerable consequence for maintaining the functions of the great veins near the heart.

He observes that the veins are all formed of extremely flaccid coats; so as to collapse entirely when empty, provided the atmospheric pressure act on their external surface,—and that they would consequently be all reduced to a similar state by the suction-power of the heart and chest, unless their calibres were kept open by some peculiarity of mechanism. This peculiarity consists in the adhesion of the parietes of certain veins to adjacent parts, which tend to keep them stretched. Such a structure has been long known to exist in the case of the sinuses of the brain, and ramifications of the *venæ hepaticæ*; the former of which are kept constantly distended by the organization of the *falx* and *tentorium* of the *dura mater*, and the latter by the incompressible nature of the organ through which they are distributed. But *M. Berard* now calls the attention of physiologists to certain peculiarities in the organization of other veins for accomplishing the same purpose. The entrance of the superior vena cava into the right auricle of the heart is kept in a state of constant tension by the prolongation over it of the strong fibrous covering of the pericardium; and the subclavian veins, the junction of the jugulars with these veins, as also the whole course of the axillary veins from the *scaleni* muscles to the arm-pit, are maintained in a similar state, by being attached to various sponenrotic membranes at the root of the neck. Hence if the superior cava, subclavian, axillary, or commencement of the jugular veins be divided, they do not collapse as other veins do, but remain gaping, unless they are detached from the texture by which they are kept distended, and then they collapse like veins generally. Were it not for this organization, it is obvious that the suction-power of inspiration, even of the powerful kind which is admitted by some physiologists, could have little or no effect in moving the blood towards the heart along the superior cava. But the chief veins being kept in a state of distension, and so enabled to resist the compressing tendency of atmospheric pressure, the pumping or inspiring power of inspiration becomes effective; and it is particularly worthy of remark, that as the sponenrotic membranes to which the veins are attached extend from bones to bones, and are most stretched

428 *Atmospheric temperature on the Mortality among Infants.*

during the expansion of the chest,—it is during the act of inspiration that the veins are most extended. The same organization will also for the same reason account for the entrance of air into the heart, from wounds of the veins at the root of the neck during surgical operations. If the subclavian or commencement of the jugular vein is opened, air will enter to a certainty, unless immediate precautions be taken to exclude it; and as for the same accident occurring when more distant veins are opened, it will be found, we doubt not, to arise from the divided vein having acquired, from connexion with diseased parts, an organization similar to that possessed by the subclavian and axillary veins in their natural state. *M. Bernard* farther observes that the inferior cava, by its passage through the diaphragm, is similarly organized with the superior cava. It remains constantly extended and gaping, even when empty. Hence the suction effect of inspiration is transmitted to the hepatic veins, which we have already seen are fitted for conveying it by a corresponding structure. It is thus apparent that the inspiratory power of the chest is one of the powers which contribute to the movement of the blood in the vascular system of the liver. The want of a corresponding structure of the great veins leading to the extremities, renders this moving power of no influence whatever on the circulation in the other branches of the inferior cava.

On the Animal Temperature in different Latitudes. (Annales des Sciences Naturelles, Mai 1830.)—A few years ago Dr John Davy made some interesting experiments on the differences which take place in the temperature of the human body in passing to warmer or colder latitudes (*Edin. New Philos. Journal*); and the result was that in warm climates it rises, and in cold climates falls a little. These experiments have been more lately repeated by *M. Reynaud* of Paris during a voyage to the East. The voyage was from Toulon by the Cape to the Isle of Bourbon, the Maldivians, the Coromandel coast, Bengal, the coast of Pegu, Ceylon, the Straits of Junda, Java, and then home by the Cape to Havre; and it lasted from May 1827 to December 1828. The thermometers used were carefully compared by *M. Arago* with the standard at the Observatory of Paris, both before and after the voyage,—so that the accuracy of the observations is unquestionable. There are seven sets of experiments, four of which were made in the Torrid, and three in the Temperate zones, and each set was made on the same twelve men, all of them being in good health, most of them athletic, and all fed, and exercised almost precisely in the same manner. On the 1st July, in $10^{\circ} 4'$ north latitude, the air being 79° F. the average temperature of twelve Europeans was $99\frac{1}{4}^{\circ}$. On the 10th of August following, in $36^{\circ} 10'$ south latitude, the air being $62\frac{1}{4}^{\circ}$, the average temperature of the body was $98\frac{3}{4}^{\circ}$. On the 11th September under the line, with an atmospheric heat of 86° , the temperature of the body was on an average very nearly 100° . Next year on the 13th May, in latitude $7^{\circ} 1'$ south, the air being 86° , the body was $99\frac{1}{4}^{\circ}$. On the 14th of October following, in $32^{\circ} 23'$ south latitude, the air being $62\frac{1}{4}^{\circ}$, the body was 99° . On the 30th of October, under the line, with an atmospheric temperature of 79° , that of the body was $99\frac{1}{4}^{\circ}$. On the 4th December, in 46° north latitude, the air being $53\frac{1}{4}^{\circ}$, the body was 99° . Hence it will be perceived, that the range of the animal heat, between climates where $53\frac{1}{4}$ and 86 are the extreme temperatures of the atmosphere, is one degree and a quarter of Fahrenheit, and that it rises as the atmospheric heat rises, and *vice versa*,—with some slight irregularities, probably to be ascribed to the coldness or heat of the climate, which the subjects of experiment had just left.

On the influence of atmospheric temperature on the Mortality among Infants. (Annales d'Hygiène Publique et de Médecine-Légale, Janvier et Avril 1830.)—*MM. Villermé* and *Mylius-Edwards* have proved by a set of statistical tables, that the mortality among young infants is considerably greater in the colder northern departments of France, than in the warm southern departments, and that in the same place it is considerably greater during the cold months of the year than during the temperate months, and also somewhat greater in the hottest months than in those which are temperate. Thus in the northern part of France, situated above the latitude of 49° , the mortality among children within the first three months of life was in 1818 as 1 to 7.96 births,—south of the 45th degree of latitude it was only as 1 to 10.72; and in 1819 it was in the former district as 1 to 9.12, and in the latter as 1 to 11.7. At Dunkirk the mean temperature of the year is $11\frac{1}{4}$ degrees less than at Toulon, the former being 50.4 F. the latter 62° . Thus again in the year 1818

the mortality for the same period of life throughout the whole of France varied from one death in 7.22 births during the month of January to one in 9.8 in the month of May; and in 1819 from one in 7.66 during January to one in 9.97 during the month of May. During the three cold months of December, January, and February, the average for the two years was one in 7.81; during March and April it was one in 8.78; during May, June, and July, one in 9.75; during August and September one in 8.06; during October and November one in 8.68. In order to perceive fully the effects of temperature in producing these variations, the English reader must keep in remembrance, that August and September are in France extremely hot months, while October and even November are much more mild than in Britain. The inference to be drawn from the numerical statements here given as to the mortality in different seasons is, that in the coldest months it is greatest, in the warm months at the beginning of summer least, but somewhat greater even in the warm months when the extreme heat of summer has endured for a considerable time.

These facts have been since very satisfactorily confirmed by the statistical inquiries of *M. Caffort* at Narbonne in the middle of France. In the course of fifteen years subsequent to 1810, the deaths in that town among children within the first three months was one in 9.57 births; which is intermediate between the mortality in the northern and southern departments of France as given above. Of 532 deaths among children of the same age, 163 occurred in the months of December, January, and February,—113 in April, March, and May,—125 in September, October, and November,—and 131 in June, July, and August. On taking the proportion of deaths to births the average for the winter quarter is one in 8.43 births, for the spring quarter one in 12.05, for the autumn quarter one in 10.65, and for the summer quarter one in 8.95.

Nature of the Urine during the formation of the Cystic Oxide Calculus, (Journal of Science, Literature and Art, January to March 1830.)—*Dr Venables* of Chelmsford has lately had a good opportunity of carefully examining the urine in a case of that rare form of calculus in the bladder,—the Cystic Oxide. The only instance where the urine had been previously examined in the same circumstance was in the case of a gentleman mentioned by *Dr Prout* in his work on the Diseases of the Urinary Organs (p. 166,) who found that the urine varied in density from 1020 to 1022, was rather abundant, faintly acid, of a yellowish-green colour and peculiar odour,—that there was formed on standing a greasy-like film on the surface and a copious pale precipitate, both of which were composed of triple phosphate of ammonia and magnesia and cystic oxide,—that cystic oxide was also precipitated on the addition of acetic acid,—and that there was very little urea and scarcely any lithic acid. This analysis corresponds precisely with that of the urine in *Dr Venables'* case.

The subject was a labourer's wife, forty-seven years of age, stout, corpulent, sallow, but otherwise healthy looking. She had several children. She was much annoyed with constant obtuse pain in the loins, like lumbago, and occasional attacks of acute pain, like nephritis, which rendered depletion and other powerful antiphlogistic remedies necessary. She had frequently passed small calculi after her attacks of severe pain, the departure of the pain being suddenly accompanied with a sense as of something dropping towards the bottom of her body, and followed in a day or two by the voiding of a stone. On one occasion she discharged a great number of small ones of the size of peas, connected together by a string like beads. *Dr Venables* procured one equal in size to a large nut, which like the rest had been passed naturally. It weighed twelve grains, resembled the triple phosphate in general appearance, and had actually some crystals of that calculous matter on its surface. It was of the consistence of wax, was not laminated, had a crystalline fracture and a density of 1714.3. By the heat of the blowpipe a strong peculiar fœtor was exhaled, and by the process of incineration a whitish ash was procured, not alkaline. It was soluble in nitric, sulphuric, muriatic, and phosphoric acids, insoluble in water, alcohol, acetic, citric, and tartaric acids, as well as in the carbonate of ammonia. It was dissolved by the two fixed alkalis and their carbonates, by lime water and the solution of baryta. Acetic acid threw it down from its solution in alkalis. These are the properties by which the calculus was proved to be the Cystic Oxide.

The urine was of the ordinary quantity, of a greenish-yellow colour, like a nearly ripe melon, in taste slightly saline, of a peculiar odour somewhat like that of the

430 Caution as to the use of the Hydriodate of Potass.

sweet-briar, of an oily-like consistence, and in specific gravity between 1020 and 1025. It was turbid from an impalpable powder, which on standing partly subsided and proved to be chiefly mucus; but some turbidity still remained, which by filtration was proved to arise from fine particles of cystic oxide in suspension, with a little ammoniac-magnesian phosphate and some mucus. By long standing a stratum at the top became clear and oily-looking. The urine faintly reddened litmus, gave a precipitate of cystic oxide with alcohol and with acetic acid, and a copious precipitate of mixed cystic oxide and ammoniac-magnesian phosphate with the carbonate of ammonia. It was very deficient in urea; not a particle separated on the addition of nitric acid to its syrupy extract. Lithic acid was also very defective, as none separated on the addition of the mineral acids after the urine was evaporated to one-third of its volume. The patient got much easier, and the urine more dense, the cystic oxide less abundant, and the lithic acid more abundant, by constant attention to the state of the bowels, and the administration of muriatic acid, and of pills made of sulphate of morphia, ipecacuanha, extract of colchicum, and extract of hyoscyamus.

MATERIA MEDICA.

Alleged discovery of a substitute for Sulphate of Quina. (*Revue Médicale*, Juin 1830.)—In June 1830, M. Leroux, a druggist at Vitry-le-Français, sent to the Academy of Medicine an essay on the bark of the willow, with two products extracted from it, which he termed Salicine and Sulphate of Salicine. MM. Gay-Lussac and Magendie were commissioned to examine these substances, both chemically and therapeutically. In the succeeding July M. Leroux ascertained, as well as the reporters on his paper, that Salicine is not an alkaloid; that instead of saturating acids, acids decompose it, and take away its property of crystallizing; and further, that it does not contain any azote. It was consequently evident that the substance denominated sulphate of salicine could not be a salt; which accordingly was ascertained both by the discoverer and by the reporters. The substance to which M. Leroux has given the name of salicine is when pure in white, delicate, pearly crystals, very soluble in water and alcohol, but insoluble in ether, extremely bitter to the taste, and possessing the aroma of willow bark. In order to obtain it, three pounds of the bark of the willow, (*Salix helix*, as determined by M. Desfontaines) being dried and reduced to powder, are boiled in fifteen pounds of water, in which four ounces of carbonate of potass have been previously dissolved. After filtration, two pounds of the solution of subacetate of lead are added. The product is then filtered, and treated with sulphuric acid, and subsequently with sulphuretted-hydrogen gas to remove the lead. The excess of acid is next saturated with carbonate of lime. The liquid is again filtered and concentrated, decolorized with animal charcoal, and filtered again white hot. It is then crystallized at two stages of evaporation, and the crystals, while drying, are excluded from the light. This process, which will undoubtedly be susceptible of simplification, gives about an ounce of salicine; and when conducted on the large scale will probably give double that quantity.

Experiments with this substance have been tried on intermittent fevers of different types, and without carrying the dose very high. M. Magendie remarked that cases of fever were cut short in one day by three doses of six grains each. Experiments equally successful were made by Doctor Miquel at La Charité, and MM. Husson and Bally at the Hotel-Dieu, and by other physicians; and all agreed that not more than from twenty-four to thirty grains of salicine was required to arrest completely the paroxysms of fever, whatever might be the type. This is about the same as the dose usually required of sulphate of quina. "In short, M. Leroux has discovered in the bark of the *Salix helix* a crystallizable principle, which incontestably possesses febrifuge virtues scarcely inferior to those of sulphate of quina. MM. Brugnatelli, Buchner, and Fontaine, had previously studied the analysis of this bark, and conceived they had succeeded in extracting its active principle in a state of purity. But it is clear from the terms employed by these chemists, that they never succeeded in separating the pure, crystallized salicine of Leroux."

Caution as to the use of the Hydriodate of Potass.—This substance does not appear to have lately proved so valuable a remedy in the hands of many British physicians as it had previously done in the hands of continental practitioners, or some of those who first employed it in this country. The difference may be partly owing

to its efficacy in many diseases having been exaggerated. But another extremely probable reason is the great uncertainty of the nature of the salt generally sold under the name of hydriodate of potass. Not very long ago, *Mr Pereira* of London had occasion to observe that the salt sold in London is frequently rendered impure with carbonate of potass. About the same time this adulteration likewise attracted our notice.—In order to ascertain the amount of the adulteration, as well as the extent to which the adulterated article is used throughout the country, we procured from a well-known and enterprising apothecary of this place, specimens from four chemical manufactories in Great Britain; and the result of our examination of them is, that all of them contain more or less water, some of them a great deal, that one only is free from carbonate of potass or other impurity, and that the remaining specimens contain that salt in a greater or less proportion,—two of them being chiefly composed of it. The only pure specimen we have examined was obtained from the manufactory of *Mr Helm*, in London. It contains $2\frac{1}{2}$ per cent. of water, and no carbonate, muriate or sulphate; the crystals tend to assume the cubic form, and some of them are large well-formed cubes, or rather short four-sided prisms; and it is entirely and readily soluble in alcohol. The water, small as its proportion is, was probably less when the article left the manufactory; because the specimen we used was taken from a large bottle nearly empty, where it had remained for some time. For obvious reasons we shall not state for the present where the other three specimens were manufactured. One of them was well enough crystallized. It contained little more than two per cent. of water; but it contained also $6\frac{1}{2}$ per cent. of carbonate of potass. The third showed no tendency whatever to assume any crystalline form,—and contained only 9.4 per cent. of hydriodate of potass, with 16.1 of water, and 74.5 of carbonate of potass. The fourth had nearly the same external appearance, and was nearly of the same degree of impurity. The hydriodate of potass amounted to no more than 10.5 per cent., the water forming 15.66, and carbonate of potass, with a little sulphate, 73.8 per cent. Of the three impure specimens the first probably received its impurity from accidental imperfections in the process; but it is not easy to admit the same explanation of the adulterated state of the two last.

The process by which the purity of the hydriodate of potass in respect to this adulteration may be ascertained is very simple. The water is of course determined by heating a given weight of the substance to a low red heat. If the salt is tolerably pure it fuses: If it contains a large proportion of carbonate of potass, even a full red heat causes but an imperfect fusion. The loss of weight is water driven off by the heat. The dry residue is then to be dissolved in pure water, and treated with nitrate of baryta, upon which a white precipitate is thrown down, if any carbonate or sulphate exists in the salt. If the white precipitate is entirely redissolved by acetic acid with effervescence, the impurity is carbonate alone. The quantity is easily determined by collecting and washing the precipitate on a filter, removing it, heating it for some time at a heat somewhat under redness, and weighing it. Every 100 grains of the carbonate of baryta thus procured correspond to 70 of carbonate of potass in the adulterated salt. This process is not *rigidly* exact, as every chemist knows, but at the same time a great deal more exact than the apothecary or physician has any occasion for.

TOXICOLOGY.

On the Poisonous effects of Oxygen and some other Gases on the Animal Body. (Quarterly Journal of Science, Literature, and Art, January to March 1830.)—

A series of very interesting experiments has been lately performed by *Mr Broughton* on the effects of certain gases on animal life, and especially on the effects of oxygen. This gas has been long known to prove deleterious to animals when breathed in a state of purity. But by a singular coincidence it has happened, that none of the experimentalists who have lately investigated the physiological operation of the gases, has paid any particular attention to the phenomena occasioned by the inhalation of oxygen. And it has consequently been left to *Mr Broughton* to discover some extremely curious and peculiar circumstances connected with its action.

The gas for the experiments was prepared from black oxide of manganese by heat, and was collected in large glass jars over water. A platform was placed within the jar, on which the animal to be experimented on could be placed above the water; and when the temperature of the atmosphere was low, the whole apparatus was kept

at a moderate heat before a large fire. Comparative experiments were made with common air in circumstances precisely similar.

Mr Broughton first remarked, as others had done, that animals die much sooner in atmospheric air than in oxygen. He farther observed, that after an animal had died in common air, the residual air extinguished flame and destroyed another animal in a few seconds; but that in the residual gas, in a jar where an animal had breathed oxygen till it died, another animal lived a long time and the combustion of a match was brilliantly enlivened. His experiments with oxygen are eleven in number; and the animals with which they were performed were the kitten, rabbit, guinea-pig, and sparrow. He commonly remarked that no apparent change occurs for the first hour; then the breathing and pulse become accelerated; afterwards a state of debility supervenes; and gradually insensibility comes on, with glazing of the eyes, slow respiration, and sometimes gasping. If at this stage of the experiment the animal be removed into the atmosphere, it speedily recovers; and even if the respiration have ceased altogether before its removal, recovery may be accomplished by artificially inflating the lungs. In a vessel of the capacity of one gallon, three hours were sufficient to bring most animals into a state of great danger, and few recovered after being confined five hours. When the body was examined soon after respiration had ceased, and when life was consequently to all outward appearance extinct, the heart was always found contracting vigorously, the whole blood of the body, both in the veins and arteries, was brightly arterial, and many of the membranous surfaces, but especially that of the lungs, were of the same florid red tint. We may extract the following experiments as good examples of the whole.

Experiments i. and ii. "A kitten ten or twelve days old was immersed in pure oxygen, and suffered no apparent inconvenience during the first hour, but afterwards its respirations were quickened and the sanguiferous system was much accelerated. To this succeeded a state of debility and gradually a total insensibility." This animal recovered on being removed at the end of three hours. A second of the same breed "was not removed until the motion of the diaphragm, (the last organ in which movement is perceptible) had ceased some minutes, and it did not become reanimated. On opening the chest, the heart was found beating strongly; and after its removal forcibly contracted on the knife when cut across. Throughout the brain and every part of the body no trace of venous blood was discoverable, but every where the arteries and veins universally carried scarlet blood, as well as both divisions of the heart, which exhibited the internal structure to be entirely of a bright florid colour; and the surface of the lungs appeared as if highly injected with vermilion." *Experiment vii.* "A rabbit about three weeks old was immersed in about two gallons of oxygen at half-past eleven in the forenoon. At three o'clock the animal was still apparently lively and unaffected, and it ate some oats and cabbage, introduced through the water under the glass. At seven, the animal's breathing was quickened, but it showed no signs of insensibility; nor until nearly eleven o'clock, was it apparently much affected, when some degree of stupor and weakness was evident. At twelve o'clock at night, twelve hours and a-half after its immersion, it was in a sitting posture, breathing quick, and somewhat dull in appearance. In this state it was left, the fire allowed to go out, and the bath to cool down to the temperature of the room on a frosty night; so that in the morning it was found dead. On opening the body, the heart and blood-vessels universally contained scarlet blood. During this experiment, as the water rose in the jar, about two or three pints of oxygen were added. A flame was excited in a blown-out taper introduced into the jar; and a mouse breathed some time in it." *Experiment xi.* "A rabbit about three or four weeks old was immersed in a gallon of fresh oxygen at one o'clock P. M. In about an hour its respiration was quickened, and in two hours it was very weak, and apparently losing its sensibility. Nearly a quart of oxygen was added during the experiment, to make up for the rising of the water. About seven, having been in the gas nearly six hours, it was convulsed and expired, and was removed in five minutes without any sign of motion. On opening the chest the heart was in full action, and the diaphragm still. No venous blood was perceptible. The gas remaining after the experiment rekindled a blown-out taper.—N. B. In all these experiments the surface of the lungs appeared much injected. The blood also was observed to be very transparent, and to coagulate remarkably quick. The right side of the heart was always much more filled than the left."

These experiments show how erroneous were the results obtained by one of the latest experimentalists on the subject, Sir H. Davy, who inferred that the fatal effects

are independent of excess of oxygen. Mr Broughton shows clearly that pure oxygen acts as a narcotic poison, that it induces a universal arterIALIZED state of the blood, and excites symptoms of severe nervous derangement. Its action exhibits the singular phenomenon of the heart being the last organ in the body to die, and yet circulating arterial blood. The contractility of the intestinal canal also continues long after the functions of the brain are annihilated.

The other gases with which he experimented were nitrous oxide, nitrogen, chlorine, sulphuretted-hydrogen, hydrogen, carburetted-hydrogen, nitric oxide and carbonic acid gas.—*Nitrous oxide gas* had precisely the same effects as oxygen; but acted with much greater rapidity. A kitten was killed in half an hour, sparrows in four or five minutes, mice in about eight minutes; but a rabbit three weeks old lived two hours and a quarter. In every case the heart was found contracting strongly after death, and the blood was florid in the veins as well as the arteries.—In *Chlorine* all animals were killed in about thirty seconds. The only important fact in Mr Broughton's experiments with it is, that the lungs presented the yellow tint and peculiar odour of the gas; so that, contrary to what is usually thought, chlorine passes the epiglottis. In his experiments with *Hydrogen*, which proved fatal in half a minute, he found that immediately after death the heart and intestines did not retain their contractility, and he therefore concludes that this gas is a positive poison, and not merely an asphyxiating gas.—*Carburetted-hydrogen*, (but he has forgotten to say which species,) acted with great rapidity, causing one or two gasps and stupor in a few seconds. The experiments with azote, sulphuretted-hydrogen, nitric oxide and carbonic acid gas present no particular novelty. Mr Broughton seems to infer from his own observations that carbonic acid is injurious merely because oxygen is wanting; but the experiments of Collard de Martigny prove that it is a positive poison of the narcotic class.

*Cases of Poisoning with Coal Gas. (Annales d'Hygiène Publique et de Médecine-Légale, Juillet 1830).—*Repeated accidents have happened in Britain from the explosion of oil gas or coal gas; but, so far as we are aware, there has not yet been a single instance of poisoning or asphyxia produced by the incautious inhalation of it. There is every reason indeed to suppose that when inhaled in a moderately diluted state, it is a very feeble poison, and that when considerably diluted, it may be breathed habitually without danger and without inconvenience. An accident, however, has lately happened at Paris, which proves that there is a limit to the statement now made, and that the escape of a large quantity of gas into a house is attended with other risks—besides the chance of explosion from some fool walking into the contaminated apartment with a light to look for the cause of escape. In April last five individuals in a warehouse in the Rue de Bussy at Paris, were more or less severely affected and one killed, in consequence of an accidental leak near the main stop-cock of the service-pipe. They went to bed about half-past ten; and about two one of them who slept on the ground floor was awakened by the smell of the gas, and a sense of approaching stupor. He immediately alarmed his companions, who slept on various floors above, and found them all in a state of profound sleep, and when awake excessively lethargic. Of the five individuals four recovered, and appear to have never been in great danger from the moment that they were freely bled from the arm. The fifth was heard moaning by the man who gave the alarm, and found insensible and incapable of being roused, with froth issuing from the mouth, vomiting, and spasmodic convulsions. A physician was immediately procured, who found all the symptoms of great oppression of the brain,—complete coma, froth at the mouth, redness of the face, stertorous respiration, and dilated pupils. An unsuccessful attempt was made to bleed him from the arm. Five-and-twenty leeches were then applied to each side of the neck; and as they filled, the wound in the vein of the arm began to bleed, while at the same time the patient recovered his senses a little, and complained of being too soon awakened. His breathing, however, continued laborious, no further amendment took place, vomiting recurred between five and seven in the morning, and he died at eight, six hours after the alarm was given.

When the body was examined next day, putrefaction had just commenced. The limbs, however, were extremely rigid. There was a good deal of pale lividity on different parts. The countenance was pale and not bloated, and the lips were not discoloured. The vessels of the dura mater discharged much blood when the skull-cap was removed; the vessels of the arachnoid were much gorged; and the sub-

434 *On Poisoning with the Compounds of Mercury.*

stance of the brain presented an unusual number of red points when cut; but there was little serosity in the ventricles. The lungs were little distended, the left united to the pleura of the ribs by old adhesions, rather pale in colour anteriorly, and not at all gorged. The right lung on the contrary was violet-coloured, the edges of its lobules emphysematous, its substance red, gorged with blood, and yielding much froth when squeezed. The membrane of the windpipe was in general white, and contained a good deal of froth. In the right bronchial tube there was a French bean of ordinary size, entire, boiled, and which had evidently proceeded from the stomach. There was no particular appearance in the heart and great vessels, except that the blood was every where completely and firmly coagulated. The surface of the intestines was reddish. The stomach contained fragments of French beans, which the deceased had taken for supper. The liver had entirely changed its appearance, and acquired a greenish-slate colour, and an unusually firm consistence.—It appears probable from the dissection and symptoms antecedent to death, that the fatal issue of the case was rather owing to the obstruction of the right lung by the bean than to poisoning with the gas.

On Poisoning with the Compounds of Mercury. (Archives Générales de Médecine, Mai 1830.)—The following singular case was lately referred by the law authorities to *Professor Orfila*. The leading question for his determination was, whether the discovery of metallic mercury in the stomach and intestinal canal of a person, who had died with such symptoms as acute poisoning with the irritants usually induces, could arise from some poisonous compound of mercury having been swallowed and subsequently decomposed and reduced to the metallic state in the body.

The general features of the case were the following:—In July 1829, a woman of the name of Villoing, after being ill for five or six days with bilious symptoms, sent for a physician, who found her affected with great oppression in the præcordia, frequent nausea, and occasional bilious vomiting, fullness of the pulse, redness of the countenance, and a yellowish tint of the eyes and skin. The physician considered her complaint a bilious disorder, and administered a little tartar-emetic. Next day he was informed she was rather better, but was requested to prescribe something for her constant sickness and vomiting; for which he accordingly ordered an opiate mixture. Two days after that a messenger arrived for him early in the morning with the intelligence that she was much worse; which, however, on his repairing to her house, did not seem to him to be the fact. The symptoms were milder, though unaltered in nature; and he did not dread any danger. But at two in the afternoon of that day she became rapidly much worse, the vomiting recurred incessantly, profuse diarrhoea supervened, and at eleven the same night she expired. It further appeared that she had no venereal affection, and that her medical attendant had never ordered her any mercury. But her husband was in possession of various poisons, and particularly arsenic, corrosive sublimate, and realgar. Still, the funeral took place without any rumour of poisoning having arisen. But suspicions began to be entertained afterwards, and the body was therefore disinterred and inspected fifteen days after burial. Putrefaction had commenced on the external surface.

In the *Chest* there was no appearance of effusion in the pleura or pericardium; the lungs were much shrunk, putrid, and soft; the heart was flaccid and its columnar carnae reduced to a pulpy consistence; the gullet red on its inner surface, especially near the stomach, but free from softening or ulceration. In the *Abdomen* the viscera were found comparatively entire; the peritoneal sac free of fluid; the intestines distended very much with gases; the stomach on the contrary shrunk on itself and presenting on its anterior surface two perforations, which will be farther described presently; the liver very large, of a deep red colour, and studded externally with small white points, the gall-bladder considerably distended with yellow bile; the other abdominal viscera healthy; the spinal column affected with a double curvature. The gullet, stomach, and intestines were then duly removed for more careful examination. The outside of the stomach presented here and there several large red and brown patches. One of the perforations was ten lines long and four broad, and surrounded by a space about two lines in breadth, where the outer and muscular coats alone were destroyed. The other was six lines long, two lines broad, and similarly bordered. The edge of both was fringed, and entirely free of hardness, thickening, or any particular vascularity. Internally, there was much emphysema, but no general softening; a bright red blush spread over the cardiac orifice, and likewise over the whole lesser curvature, though less brightly; the great sac was

much injected, and here and there superficially eroded; the whole great curvature was in the same state, with likewise many small black and ochrey stains; and at some points several globules of mercury were found. The duodenum was internally emphysematous, like the stomach, lined with much ochrey mucus, and studded with numerous mercurial globules. The ilium and jejunum presented irregular patches of vascularity, but no visible globules. The cæcum was healthy, and globules were collected to the amount of a drachm in weight. The colon was healthy till near the rectum, where there was gradually increasing darkness from ecchymosis; the rectum was red; and from the colon and rectum together another drachm of mercury was collected. On boiling the intestine so as to remove its fatty matter, it was found that there were few spots which did not appear as if penetrated by a mercurial dew from extremely minute globules.

The most careful chemical examination of the contents of the alimentary canal failed to detect any poison in them. At the same time in making this statement the inspectors properly observe that it was impossible to apply the whole process for the detection of corrosive sublimate, because that division of the process, which is intended to detect the mercurial salt united in the form of calomel with the animal tissues, was rendered fallacious by the presence of metallic mercury.

The conclusion at which they arrive from the whole inquiry is that poisoning was probable.

The investigations of Orfila set out with the question stated at the commencement of this notice. He proceeds to examine it by inquiring,—first, what compounds of mercury are capable of being brought to the metallic state, when mixed simply with the ordinary contents and textures of the alimentary canal,—and secondly, by what substances, not of the nature of aliment, taken along with mercurial preparations, the mercury may be reduced to the state of metallic globules. He finds that *corrosive sublimate* is not reduced by the ordinary contents of the stomach and intestines: when a dog was poisoned with it and either buried or left exposed to the air for two months, the mercury was found united with the textures in the form of an insoluble triple compound of mercury, chlorine, and animal matter, but no globules could be discovered even with the microscope. In like manner the *red oxide of mercury* is incapable of being reduced. The powder commonly known by the name of *protaxide* will after a time exhibit before the microscope evident globules, but this appearance may be equally seen before the powder is swallowed. If an animal is killed by the crystallized *protonitrate* of mercury, no globules are visible even after seven or eight days; but if the stomach and intestines are dried, an infinite number of very fine globules may be seen with a common magnifier adhering so firmly to the inner membrane that they cannot be displaced. All compounds containing metallic mercury in a state of fine division will present the appearance of globules after being some time in the stomach, such as the mercurial ointment or mercurial sugar; but here no decomposition, only a mere separation takes place. So much for the first set of his experiments. In the second set he tried the effect of introducing into the stomach, at the same time with the mercurial poison, some substance which possesses the property of reducing it to the metallic state. Thus the *protonitrate* and *deuteronitrate* of mercury when dissolved in water are reduced to the metallic state out of the body by oil of turpentine, arsenic, iron, copper, phosphorus, or the *protosulphate* of iron, sometimes in a few hours and always in the course of several days, even at atmospheric temperatures:—the *protosulphate* and *persulphate* of mercury are also reduced at low temperatures when in solution by the same substances,—the red oxide is rapidly reduced by a solution of the *protosulphate* of iron,—*corrosive sublimate* is reduced by all the substances which reduce the *protonitrate*, except oil of turpentine. Accordingly, when various mixtures of these disoxygenating substances with mercurial salts, such as a mixture of *protonitrate* of mercury and *protosulphate* of iron, *corrosive sublimate* and copper powder, *deuteronitrate* of mercury and oil of turpentine, were given to dogs, the animals died commonly in a few hours, and on inspecting the bodies next day, the salts were found reduced to the metallic state. But no globules could be detected by the naked eye. The metal was diffused throughout the contents of the stomach and over its membrane in extremely fine globules, visible only with the aid of a magnifier, and incapable of being displaced.

Orfila concludes from his experiments that various substances may reduce to the metallic state mercurial compounds that have occasioned death; but that this circumstance cannot give any countenance to the supposition of poisoning by such

compounds, where the globules are so large as not only to be visible, but likewise even to admit of being collected; and besides that in cases of the kind the soluble salt of mercury would scarcely be decomposed without distinct traces of the substance by which the decomposition was effected. In the case of the woman Villouing the only possible sources of the metallic mercury were—1. The administration of corrosive sublimate or any other soluble mercurial salt with some one of the substances capable of reducing it; 2. The administration of the protonitrate or protosulphate, and its reduction by the tissues of the stomach; 3. The administration of the black protoxide; and 4. The administration of metallic mercury itself. But the two first suppositions are incompatible with the discovery of large metallic globules. Two drachms of mercury at all events could not have been collected from the intestines, unless the dose of soluble salt had been so enormous that some of it must have remained undecomposed. The third supposition is incompatible with the fact, that no black powder was found lining the intestines. There remains therefore no way of accounting for the presence of the globules, except by ascribing them to mercury swallowed at once in the metallic state.—Finally, although the history of the woman's illness is suspicious, there is no evidence, according to Orfila, which can support a charge of poisoning; and the circumstances are consistent with the notion that the apertures in the stomach were spontaneous perforations.

MEDICAL STATISTICS.

Statistical Account of the state of Pharmacy in Paris. (Journal de Chimie Médicale, Juillet 1830.)—A very curious document has just been published in Paris illustrative of the state of Pharmacy in that city, apparently for the purpose of directing the attention of the French government to the necessity of relieving this class of tradesmen from the grievances to which their trade is subjected. It appears, according to the researches of the *French Statistical Society*, that in Paris and its immediate vicinity there are at present 285 pharmaceutical establishments, which employ, besides the owners, 465 persons at wages varying from twelve and sixpence to thirty-seven shillings and sixpence a-month,—that the whole capital invested in these concerns amounts to L. 522,000, that the gross proceeds are L. 134,500, and that when the interest of capital and current expences are deducted, there remains only about L. 17,600 of clear profit. This is only L. 62 for each establishment, and not quite so much as $3\frac{1}{4}$ per cent. on the capital embarked,—a most miserable result truly.

The document then proceeds to trace the causes of so low a profit in a trade usually considered lucrative; and assigns as the leading causes,—the absurd increase of persons in the trade,—the fraudulent assumption of the trade of apothecary by the druggist, grocer, herbalist, and even fruiterer, as well as the fraudulent application of his diploma by the retired apothecary,—the legal permission given to the grocer to sell 164 specific drugs among the most simple and common of them,—the sale of drugs at the hospitals, charitable institutions, and even religious establishments; by women and *Sœurs de la Charité*, who are able to drive the regular apothecary out of the market, as they have no rent, licence, or servants to pay for,—the simplification of medical prescriptions by the improvements in modern physic,—and the operation of one of the old laws regarding the medical juries, which is not sufficiently explained to be intelligible by us.

New Mineral Spring at Winkfield in Windsor Forest.—In the year 1828, whilst the digging of a well was in progress, the labourers were frequently observed to drink the waters of a spring issuing about twenty-four feet from the surface. Curiosity was excited; and on inquiry being made, the following information was obtained:—That this water possessed considerable aperient powers; dissipated very quickly the headach, brought on by the too liberal use of beer; and removed thirst and all feverish symptoms. This testimony, added to the celebrity lately acquired by the mineral waters of Windsor Park, awakened attention; and the spring was, in a short time, generally resorted to by people living in the neighbourhood. Several thousand persons have taken the water, and it may perhaps be useful to allude slightly to a few of the cases in which its beneficial effects have been observed.—A gentleman afflicted with determination of blood to the head, having, under the highest medical authority, used aperient medicines of all descriptions till they became nearly inert, had recourse to these waters. He took them for some time, was never dis-

appointed in their effects, and at length was restored to health.—In a case of gout the swelling of the foot was in the course of five days so much reduced that the patient was enabled to wear her own shoe, having previously been obliged to wear one triple the usual size.—A patient labouring under the most violent pains in the region of the stomach, resembling spasm, having witnessed the good effect of these waters in others, was induced to try them herself, and was blessed with a speedy recovery. Whenever the spasmodic affection shows any disposition to return, she never fails to have recourse to the waters, and at the age of 67, she now lives in general good health.—From their diuretic qualities these waters have been successfully taken in several dropsical cases; and in bilious and dyspeptic cases they have never failed to afford relief. In a case of epilepsy their good effects were manifested in a most remarkable degree. Bleeding and various medicines had been tried, but the disease still recurred. The patient then took to the use of the waters, and has succeeded in keeping off the fits for seven months. There are many similar cases to all the above who have been relieved.—A patient afflicted with asthma for eighteen years, had consulted the medical profession at Southampton, also in the neighbourhood of Bath, and various other places; they declared that the malady must be left to take its course as they were unable to remove it. Last summer at Abingdon, where he was summoned on a trial, he caught cold, and was so ill as to be unable to cross the room, or lie down on his bed for fear of suffocation. On his return to Winkfield, where he resides, he began the use of these waters and was completely cured, nor has he had any recurrence for the space now of ten months.

This water is colourless, almost perfectly transparent, and inodorous. Exposed to the air, it soon covers the sides of the vessel with a white precipitate, which is carbonate of lime. Boiling produces a copious precipitate, which is lime, magnesia, silica, and alumina. Litmus paper is slightly reddened by it, showing the existence of uncombined acid, which is supposed to be carbonic.

According to an analysis by Mr Walcker of Brighton, (*Quarterly Journal of the Royal Institution*, March 1830,) it contains the following substances.

| In 1000 Grains. | | In 1 pint (34,659 cubic inches.) | |
|------------------------------|------------|----------------------------------|---|
| Carbonate of Lime, | 0.9344 | 8.2507 | |
| Sulphate of Lime, | 0.9407 | 8.3064 | |
| Potassa, | 0.1289 | 1.1382 | |
| Soda, | 1.9452 | 17.1761 | equal to 39 gra. of crystallized Glauber Salt. |
| Magnesia, | 2.4000 | 21.1920 | equal to 43½ gra. of crystallized Epsom Salt. |
| Nitrate of Magnesia, | traces | | |
| Chloride of Magnesium, | 2.9804 | 26.3169 | equal to 56 gra. of Muriate of Magnesia. |
| Silica, | 0.1043 | 0.9210 | |
| Alumina, | 0.0446 | 0.3938 | |
| Total in grains, | 9.4785 | 83.6951 | |
| Carbonic Acid Gas, | 1.766 gra. | 3.306 | } cubic inches at 51° as the temperature of the well. |
| Atmospheric Air. | | 0.656 | |
| Specific gravity at 60° Fah. | 1.00897 | | |

According to an analysis of the Park water by Professor Brande, 1 pint, or 7000 grains contain,

| | |
|-----------------------|------|
| Sulphate of Magnesia, | 38 |
| Muriate of Magnesia, | 24.5 |
| Sulphate of Soda, | 10.8 |
| Muriate of Soda, | 9.3 |
| Sulphate of Lime, | 3.0 |
| Carbonate of Soda, | 2.4 |
| Total in grains, | 88.0 |

The Winkfield spring contains nearly double the quantity of muriate of magnesia

which that of the Park does. On the whole, the Winkfield spring seems well calculated to accomplish the objects usually held in view in the use of the saline mineral springs, and must be very useful in stomach disorders, with excessive fullness of the vascular system, either general or local.

Medical Graduations at Edinburgh.—On the 10th of July 1830, the Senatus Academicus of the University of Edinburgh conferred the degree of Doctor in Medicine on the following Gentlemen, in number one hundred and seven, after having gone through the appointed examinations, and defended publicly their inaugural dissertations.

| <i>Of Scotland.</i> | | | |
|---------------------------|---|-------------------------|---|
| Thomas J. Aitken, . | De Hydrargyro. | Michael J. Strain, . | De Asthmate. |
| John Brown, . | — Epilepsia. | John Taylor, . . | — Cynanche Tracheali. |
| James Bryce, . | — Amaurosi. | Allen Thomson, . | — Evolutione Cordis in Animalibus Vertebratis. |
| David Burnes, . | — Febre Mediterranica. | <i>Of England.</i> | |
| George Butchart, . | — Ascite. | Thomas Agar, . | De Scrofula. |
| John Campbell, . | — Hernia Inguinali. | William Alexander, . | — Dyspepsia. |
| William Carfrae, . | — Acido Lithico. | James Borret, . | — Carcinomate. |
| Charles H. Carnegie, . | — Venarum Inflammatione. | George Cox, . . | — Calorico. |
| David C. Carruthers, . | — Cholera. | Willison Cryer, . | — Capitis Injuriis. |
| James Cornfoot, . | — Hepatitide. | George W. Dyke, . | — Neuralgia. |
| William Crambe, . | — Dyspepsia. | James T. Fenwick, . | — Erysipela:e Phlegmonoidea. |
| Alexander Crichton, . | — Inflammatione Hepatis Acuta. | John Foubroke, . | — Surditate. |
| David Dumbreck, . | — Enteritide. | Meredith Gairdner, . | — Fontibus Calidis. |
| Laurence Edmondstone, . | — Hepatitide. | Henry T. Green, . | — Uteri Excisione. |
| Thomas Fraser, . | — Rubcola. | Robert Hingeston, . | — Pleuritide. |
| Matthew B. Gairdner, . | — Motu Impulsi et Sono Cordis. | Arthur T. Holroyd, . | — Homœopathia. |
| John Galen, . | — Morbo Coxario. | James H. Lane, . | — Secretionibus Animalibus. |
| James C. Gordon, . | — Cynanche Tracheali. | Edward Lees, . . | — Nostalgia. |
| Chas. W. M. S. Graham, . | — Astringentium Usu. | Samuel Malins, . | — Cynanche Tracheali. |
| Thomas Hunter, . | — Morbis Laryngis. | William Palmer, . | — Podagra. |
| John Irvine, . | — Vitiis Cordis Rheumatismo tribuendis. | Alfred Prentice, . | — Ustionibus et Ambustionibus. |
| Thomas R. Jameson, . | — Irritatione. | Walter H. Robertson, . | — Rheumatismo. |
| Adam Keir, . . | — Frigoris Effectibus. | William H. Robertson, . | — Cruditate. |
| William Macdonald, . | — Diabete. | Edward Taylor, . . | — Concussione Cerebri. |
| Donald Macfarlane, . | — Cute Humana. | Theophilus Thompson, . | — Effectibus aliquando perniciosis missionis Sanguinis. |
| Nathaniel F. Mackenzie, . | — Cynanche Maligna. | Charles Underwood, . | — Variis Modis Calculos Extrahendi. |
| John Malcolm, . | — Cynanche Tracheali. | <i>Of Ireland.</i> | |
| James Monro, . | — Humero Luxato. | Francis P. Beamish, . | De Anasarca. |
| John Murray, . | — Fontibus Medicinalibus. | O'Brien Bellingham, . | — Pneumonia. |
| James Ogilvy, . | — Inguinali et Crurali Hernia quatenus ad Anatomem spectat. | Benjamin R. Bird, . | — Hydrothorace. |
| George K. Pitcairn, . | — Ambustionibus et de Combustione Spontanea. | George H. Brownrigg, . | — Perinæ Dissectione. |
| David B. Reid, . | — Melancholia. | William Cavin, . | — Phthisi Pulmonali. |
| John Reid, . . | — Aneurismate. | John Coghlan, . | — Inflammatione Neonatorum Conjunctivali. |
| David Ritchie, . | — Rachitide et Mollitie Ossium. | John Costello, . . | — Lithotomia. |
| Robert Stevenson, . | — Dysenteria. | Patrick Costello, . | — Gastritide. |
| Alexander Stewart, . | — Hydrothorace. | John Dickson, . . | — Pneumonia. |
| | | William Dowling, . | — Typho. |
| | | Francis P. Drew, . | — Dysenteria. |
| | | Nicholas Fitzpatrick, . | — Angina Pectoris. |
| | | Charles G. Foott, . | — Iritide. |

| | |
|--|--|
| John Gardlan, . . . De Hernia Femoralis. | Patrick Ronayne, . . . De Ophthalmia. |
| Thomas Garvey, . . . — Hydrocele. | Michael H. Ryan, . . . — Hæmorrhagia. |
| Thomas Gillespie, . . . — Febre Indis- Endemica. | Christopher J. Shee, — Angina Pectoris. |
| William L. Gilliland, — Febre Puer- perali. | John Silver, . . . — Dysenteria. |
| Robert S. Hannay, . . . — Structura Ar- teriarum. | Thomas Sinclair, . . . — Colica. |
| Thomas W. Hearn, — Amaurosi. | Joseph Wright, — Structura Urethræ. <i>From Spain.</i> |
| James Heffernan, — Hepatitide Acuta. | Antonio Bellmunt, . . . De Cynanche Tracheali. <i>From America.</i> |
| William Hogan, . . . — Pleuritide. | Arthur J. Beaumont, De Mania. <i>From Canada.</i> |
| Richard L. Hopkins, — Dysenteria. | James Robertson, . . . De Bronchocela. <i>From Newfoundland.</i> |
| Andrew W. Hume, — Pneumonia. | Samuel Carson, . . . De Stethoscopia. <i>From Barbadoes.</i> |
| Samuel Irvine, . . . — Cholera. | John Bush, . . . De Febre Continua. <i>From Santa Cruz.</i> |
| Edward Jago, . . . — Hepatitide Acuta. | William H. Dewhurst, De Generis Gan- glionici Nervorum Structura et Functionibus. <i>From East India.</i> |
| Edward Knott, — Apoplexia Sanguinea. | James Gregory Vos, De Ruminatione Humana. |
| Laurence J. Meagher, — Febre Inter- mittente. | |
| Edward Murta, . . . — Dyspepsia. | |
| Timothy O'Brien, — Rheumatismo Acuto. | |
| Thomas H. Orpen, — Bronchitide Acuta. | |
| George N. Page, — Concussione Cerebri. | |
| Robert Reardan, — Hernia Inguinali. | |
| William H. Reid, . . . — Enteritide. | |

It will be observed that the New Regulations of this University, promulgated in 1825, having now come into operation, almost all the Graduates of the present year have conformed to them, and have, consequently, had a twelvemonth more of medical study, and of hospital attendance, and been required to attend three more courses of lectures, than were formerly imperative on them. Some apprehension was felt, and must always be felt, in legislating for the education of medical men, in a country where no class of practitioners enjoys a monopoly of practice, lest the increased burdens laid on medical graduates by these changes in the regulations, should have more effect in deterring practitioners from the full course of study to be required of them, than in raising the qualifications of those obtaining the degree; and it was obvious, that, if the number of practitioners taking the full course of study and the degree had been in consequence materially diminished, the average attainments of medical men would have been lowered throughout the country, and the public the losers rather than gainers by the change.

These considerations are quite sufficient to demand much caution and circumspection in the proceedings of public bodies charged with medical education. In the present case, we are happy to say, it appears now demonstrated that the changes have not been carried too far. The number of graduates of this year, as was expected, is somewhat less than the average of the last five years; but it is *precisely the same* as the average for the five years ending with 1825, and is *fifteen more* than the average of the five years ending with 1820; so that the University has attained the object it had in view, viz. to raise the qualifications of its medical graduates, without diminishing their number.

Surgical Examinations at Edinburgh.—August 2, 1830.—Since August 1829, the following Gentlemen, one hundred and sixty-two in number, have appeared before the Royal College of Surgeons of Edinburgh, and having produced certificates of their completing the course of study prescribed by the College, and having been admitted on examination, have been found fully qualified to practise the arts of Anatomy, Surgery, and Pharmacy, and have received Diplomas accordingly.

Of Scotland.

John G. M. Burt,
William M. Strang,
William Crambe,
William Brown,
Robert Stevenson,
George K. Pitcairn,

Michael J. Strain,
James C. Gordon,
Turnbull Calder,
Charles Marshall,
George Aikman,
William O. H. M'Cheyne,
George Oman,

Thomas Glog,
Archibald D. Robertson,
David Thomson,
John Steel,
James Bryce,
David A. Leslie,
Francis B. Moffat,

Andrew Liddle,
James Squair,
William Donald,
Alexander Walker,
David Arylesh,
William Baird,
Campbell M'Kinnon,
Archibald Crawford,
John M'Cosh,
John M'Intyre,
William B. Craig,
William Armour,
James M'Leod,
James Simpson,
David Wilson,
Joseph Brown,
Edward B. Sheriffs,
Robert Smith,
James Philips,
Peter Bell,
George Richardson,
John Mundell,
James Chalmers,
William Catton,
James Dickson,
William Graham,
John Jeffrey,
Charles Whitlaw,
James Aitkin,
James L. Emslie,
Joseph Norval,
John Watson,
William Clark,
Andrew B. Tosh,
William C. Saunders,
John Whitton,
William J. Thomson,
David Trail,
Alexander Campbell,
David W. Jobson,
Charles Marshall,
Alexander M'Donald,
David Grierson,
Samuel B. Smith,
James Miller,
Robert S. Boyd,
James Porter,
James Lawrie,
David Duncan,

William Flockhart,
William Charters,
Alexander Milligan,
William Clerk,
James M'Nicol,
David Clark,
John Affleck,
Adam Keir,
Patrick Wood,
Daniel Fraser,
Walter Bruce,
John Crosbie,
James Donald,
William Thomson,
Thomas Omond,
Francis Dind,
Fergus Fergusson,
Thomas Leckie,
David Frew,
William Shaw,
Alexander Drummond,
Archibald Stewart,
William P. Bain,
John Brodie,
Archibald M'Rae,
Alexander Haining,
Andrew Henderson,
Elliot Stavert,
William Allan,
James Douglas,
William Arbuckle,
John Maxwell.

From England.

Henry T. Green,
Henry Stodart,
William Elliot,
George Gill,
Lancaster Leathes,
Isaac Burns,
James W. Pickford,
Richard J. Brassey,
John P. Margetts,
Thomas O. Mitchell,
Thomas Petty,
Henry Wilford,
James H. Lane,
Joseph Teale,
Robert Hall,
Edward W. Hughes,

Henry Foley,
Ebenezer Mitchell,
Booth Eddison,
Thomas Allan,
Henry Glennie,
Joseph Fosbrooke,
George P. A. Greeves,
James Holroyde,
Richard Altham,
John Marsh,
George Thomson,
From Berwick-on-Tweed.
John Gracie,

From Ireland.

James E. Donlevy,
John Farrel,
John Campbell,
John Dickson,
James D. Marshall,
George H. Browning,
William Burgess,
Randall Y. Kenney,
Thomas L. Parkinson,
John O'Neil,
Thomas Markham,
Charles G. Foot,
Daniel Deveny,
John Baird,
William L. Gilliland,
John Bradley,
Thomas Reid,
Laurence J. Meagher,
Timothy O'Brien,
John Hamilton,
Francis P. Beamish.

From Abroad.

James G. Vos,
Archibald Steuart,
Robert Steuart,
James Proudfoot,
George Brooks,
William M. Anderson,
James Cadett,
John C. Belin,
Thomas S. Blackwood,
John Racey,
George J. Harding,
John F. Kennedy.

INDEX

| | Page | | Page |
|---|------|---|-------|
| Acupuncture, Dr J. Renton on, | 100 | <i>Graham, Mr.</i> See Calculus. | |
| <i>Addison, Dr.</i> , on female disorders, | 194 | <i>Gregory, Dr J. C.</i> , on the use of | |
| Air in the veins, on its entrance in | | the stethoscope in diseases of the | |
| operations, | 427 | lungs and pleura, | 24 |
| Amaurosis, on the use of strychnia | | <i>Guthrie.</i> See Arteries. | |
| in, | 415 | <i>Hamrick, Mr.</i> , his practical re- | |
| Aneurism, Guthrie and Wardrop | | marks on surgery, | 185 |
| on, | 349 | Hare-lip, cases of, | 88 |
| Animal matter, chemical action of, | | <i>Hart, Mr John</i> , on the actions of | |
| and air, | 243 | the heart, | 269 |
| Apoplexy of spinal chord, | 203 | <i>Harty, Dr</i> , on purpura, | 57 |
| Asphyxia, on the cause of, | 74 | Harveian Society, | 219 |
| Arteries, Guthrie on the diseases of, | 349 | Heart, on the actions of, | 269 |
| <i>Ballingall, Dr.</i> , on military surgery, | 412 | <i>Henderson, Dr, P. B.</i> See Poison- | |
| <i>Boivin, Madame</i> , on vesicular mole | | ing. | |
| and miscarriage, | 380 | <i>Hennen</i> , his sketches of medical to- | |
| <i>Bodkin.</i> See Brain. | | pography, | 140 |
| Brain, injury of left hemisphere, re- | | <i>Hodgkin, Dr</i> , his inquiry into the | |
| covery from, | 319 | anatomical characters of tumours, | 164 |
| Calculus, cystic oxide, on its forma- | | Hospital, Surgical, Quarterly Re- | |
| tion, | 429 | port, | 1-221 |
| Calculus, intestinal, producing per- | | Hunterian medal, | 219 |
| foration, | 312 | Hydriodate of potass, on the adul- | |
| <i>Carrwell, Dr.</i> , on the digestion of | | teration of, | 229 |
| the stomach, | 282 | Hysteria, Mr Tate on, | 194 |
| <i>Christison on Poisons.</i> | 406 | Insanity, Dr Connolly on, | 370 |
| Climate, Dr Clarke on, | 192 | Kidneys, Dr England on the func- | |
| <i>Connolly, Dr.</i> , on insanity, | 370 | tional disorders of, | 175 |
| <i>Corrigan, Dr.</i> his report on the dis- | | <i>Lawrence.</i> See Malformation. | |
| eases of Dublin, | 91 | <i>Lawrence</i> on the venereal diseases of | |
| <i>Dance</i> on uterine phlebitis, | 328 | the eye, | 393 |
| <i>Davy, Dr John</i> , on air and animal | | <i>Lee, Dr.</i> , on inflammation of the | |
| matter, | 243 | uterine veins, | 178 |
| <i>Dewar, Mr.</i> , his cases of hare-lip, | 88 | Licentiates, Surgical, of Edinburgh, | 438 |
| <i>Dobson, Dr.</i> , his case of lithotrity, | 323 | Lithotrity, case of, | 323 |
| Donegal, on the medical topogra- | | Longevity, difference of that of rich | |
| phy of, | 273 | and poor, | 218 |
| Dublin, see Corrigan. | | Lungs and pleura, on the diseases | |
| <i>Duplay</i> on puerperal fever, | 328 | of, | 24 |
| Erysipelas treated by nitrate of sil- | | <i>Luroth</i> on softening of the uterus, | 328 |
| ver, | 111 | Malformation, cases of, | 107 |
| <i>England, Dr.</i> , on the functional dis- | | Malformation of intestines, case of, | 314 |
| orders of the kidneys, | 175 | <i>Maunsell</i> on the medical topogra- | |
| Epilepsy, peculiar case of, | 218 | phy of Donegal, | 273 |
| Excision of diseased joints, | 209 | Medal, Hunterian, | 219 |
| Gills, on currents produced by those | | Miscarriage, Madame Boivin on, | 380 |
| of tadpoles, fishes, &c. | 113 | Mole, vesicular, on, | 380 |
| Gonorrhoeal ophthalmia, | 393 | Mortality, Parisian bills of, | 217 |
| <i>Goodwyn, Dr.</i> his posthumous an- | | — of infants, influence of | |
| swer to Bichat, | 74 | temperature on, | 428 |
| Graduations, medical of Edinburgh, | 438 | Ophthalmia, venereal, on, | 393 |

| | Page | | Page |
|---|------|--|------|
| Ovaria, on the diseases of, . . . | 123 | Stomach, digestion of after death, . . . | 203 |
| Paraguay, the venomous snakes of, . . . | 206 | Stomach, on its digestion, . . . | 282 |
| Pharmacy, state of, in Paris, . . . | 436 | Stokes, Dr., and Mr Hart on the action of the heart, . . . | 269 |
| Poisons, Christison on, . . . | 406 | Strychnia, its use in amaurosis, . . . | 415 |
| Poisoning by mineral acids, . . . | 212 | Surgery, military, Dr Ballingall on, . . . | 412 |
| — by empyreumatic oil, . . . | 214 | Syme, Mr James, his quarterly report, . . . | 221 |
| — by cantharides, . . . | 214 | Syphilitic ophthalmia, . . . | 393 |
| — by spoiled food, . . . | 215 | Tumours and adventitious growths, their anatomical characters, . . . | 164 |
| — by the boneto, . . . | 317 | Tonnellé on puerperal fever, . . . | 328 |
| — by bismuth, . . . | 216 | Uterine irritation, Dr Addison on, . . . | 194 |
| — by mercury, . . . | 434 | Uterine phlebitis on, . . . | 328 |
| — by irritating gases, . . . | 431 | Uterus, on inflammation of the veins of, . . . | 178 |
| — by coal gas, . . . | 433 | Uterus, on its softening, . . . | 328 |
| Potassa, hydriodate, on the adulteration of, . . . | 429 | Tate, Mr, on hysteria, . . . | 194 |
| Puerperal fever, treatises on, . . . | 328 | Temperature, on the animal, in different latitudes, . . . | 428 |
| Purpura, on mercurial purgatives in, . . . | 57 | — on the influence of atmospheric on the mortality of infants, . . . | 428 |
| Quina, on a substitute for, . . . | 430 | Transfusion of blood, . . . | 208 |
| Ranken, Mr H. L. See epilepsy. | | Venables, Dr, on the formation of the cystic oxide calculus, . . . | 429 |
| Renton, Dr J., on acupuncture, . . . | 100 | Wardrop on aneurism, . . . | 349 |
| Roux on excision of diseased joints, . . . | 209 | Winkfield, new mineral spring at, . . . | 436 |
| Seymour on diseases of the ovaries, reviewed, . . . | 123 | | |
| Sharpey on motions caused in fluids by the surfaces of animals, . . . | 113 | | |
| Shortt, Dr, on the use of strychnia in amaurosis, . . . | 415 | | |
| Spinal apoplexy, case of, . . . | 203 | | |
| Snakes, venomous, on the treatment of bites by, . . . | 206 | | |

END OF VOLUME THIRTY-FOURTH.

No. CVI. will be published on the 1st of January 1831.

DEC 4 1916

EDINBURGH:
PRINTED BY JOHN STARK,
Old Assembly Close.

UNIVERSITY OF MICHIGAN



3 9015 06709 3727

A 601100

